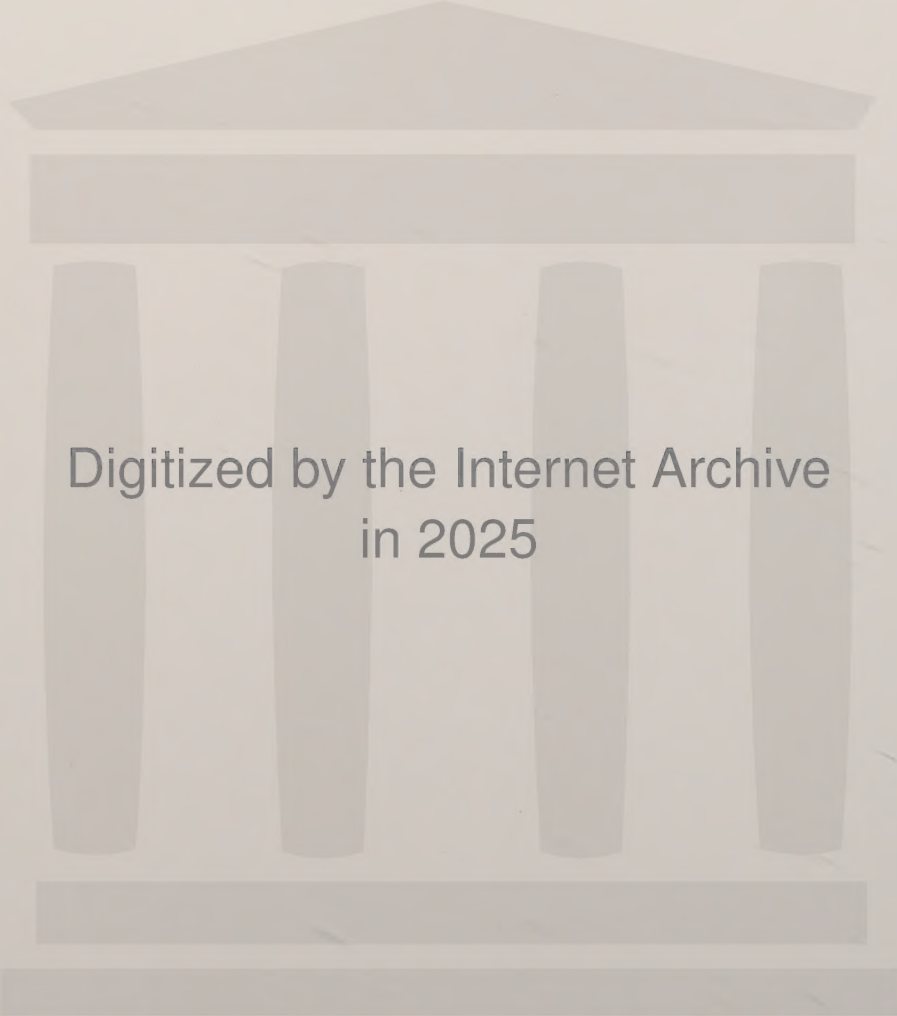


The builder's jewel: or, the
youth's instructor, and
workman's remembrancer. ...
By B. and T. Langley. The
eleventh edition.

Batty Langley





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Langley, Batty

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INTRODUCTION.

NOTWITHSTANDING there are many Volumes already extant on the Subject of Architecture, yet, as not one of them is made a fit Size for the Pocket, and it being an Impossibility for the general Part of Workmen to retain and carry in their Minds all the useful Rules and Proportions, by which Works in general are performed. I have therefore, at the Request of many good Workmen, and for the Sake of young Students, compiled this Work, wherein I have reduced the whole to such short and easy Rules, that the Workman may not only at the first View renew his Memory, as Occasions may require, but Apprentices, who may be absolutely unacquainted with this noble Art, and are so unfortunate as many have been, and are, to be bound to Jobbing Masters, who know but little; may without the Help of any, by assiduous Application at their leisure Hours, in Evenings when the Business of Days is over, &c. make themselves such Masters herein, that few Masters are able or willing to make them. And indeed I must own, that 'tis a Pleasure to me, to see the Spirit of Emulation so powerful among young Builders at this Time; when every one of Sense is endeavouring to become the most excellent in his Way, and thereby make himself the most useful both to himself and his Country.

It is useful Knowledge only that makes one Man more valuable than another, and especially that Part of Knowledge, which immediately concerns the Business he is to live by, and therefore, if this Work should prove a Help to the Improvement of Knowledge in Youth, (for whose Sakes 'tis chiefly intended,) and be no Affront to the *sage Workman*, by re-informing him of those Rules which have slipped his Memory, and informing him of others which he never knew, it will answer the desired End of their hearty Well-wisher,

London, Nov. 2, 1746.

THO LANGLEY.

CHAP. I. *Of the Orders in general, and of their principal Parts.*

THE Orders in general are the *Tuscan*, *Dorick*, *Ionick*, *Corinthian*, and *Composite*.

THEIR principal Parts are their Pedestals, Columns, and Entablatures.

THE Height of the Pedestal in every Order is always one fifth of the whole Height of the entire Order

THE Height of the *Tuscan* Column is 7 Diameters, the *Dorick* 8, the *Ionick* 9, and the *Corinthian* and *Composite* each 10 Diameters

THE *Tuscan* Column is diminished at its Astragal or Neck of its Capital, one 4th of its Diameter next above its Base, the *Dorick* one 5th; the *Ionick*, *Corinthian*, and *Composite*, each one 6th.

THE Diminution of every Column begins at one third of the Shaft's Height above the Base.

THE Heights of the *Tuscan* and *Dorick* Entablatures are each equal to one fourth of their Column's Height; and the *Ionick*, *Corinthian*, and *Composite*, to one fifth of their Column's Height.

THESE general Proportions of their principal Parts being first understood, the Propositions of their particular Parts may be easily understood also as following.

CHAP. II *Of PEDESTALS, and their Parts.*

EVERY perfect Pedestal consists of three principal Parts; namely, a Base, Dado or Die, and Cornice, which are divided as follows.

The Division of the principal Parts of Pedestals explained.

RULE. Divide the given Height in 4 Parts, as in Plates I, X, XXI, XXXIX, and LVII; give the lower 1 to the Height of the Plinth, one third of the next 1 to the Height of the Mouldings on the Plinth, half the upper 1 to the Height of the Cornice; and the Remains between will be the Height of the Dado.

WHEN a Column is placed on a Pedestal, the Projection of the Pedestal's Dado is found by the Projection of the Plinth to the Base

of the Column; which always stands perpendicular over the Upright of the Dado. But if a Pedestal is to be made without a Column, the Breadth of the Dado must be found, before we can proceed to determine the Projections of the several Members in the Base, and in the Cornice; because 'tis from the Upright of the Dado that their Projections are made; and which are found by the following Rules

The Breadth of Dado's to Pedestals explained.

RULE I. *To find the Breadth of the Dado of the Tuscan Pedestal.* Plate I.

DIVIDE the Height of the Plinth and its Mouldings in 5 Parts, and the upper 1 in 7; on z with a Radius of 4 of the great Parts, and 4 sevenths, describe the Arch xg ; then zg is the Semi-breadth required.

RULE II. *To find the Breadth of the Dado of the Dorick Pedestal.* Plate X

DIVIDE the Height of the Plinth in 5 Parts, and the upper 1 in 3; turn up 1 of the 3 Parts to n , and on x with the Radius of 5 Parts, and said one third, describe the Arch by , then xy is the Semi-breadth required

RULE III *To find the Breadth of the Dado of the Ionick Pedestal.* Plate XXI.

DIVIDE the Height of the Plinth in 3 Parts, the upper 1 in 3, and the upper 1 thereof in 3 again; then abating the 2 upper small Parts, with the Remains of the Plinth's Height on x , describe the Arch wy , then xy is the Semi-breadth required.

RULE IV *To find the Breadth of the Dado of the Corinthian and Composite Pedestals.* Plates XXXIX and LVII.

DIVIDE the Height of the Plinth in 3 Parts, and the upper 1 in 3; on x , with the Radius of two Parts, and 2 thirds, describe the Arch wy ; then xy is the Semi-breadth required.

BEFORE I shew how to determine the Projections of the Mouldings on the Plinths, and in the Cornices of the Pedestals, I must shew how to divide their respective Heights. And, first, of the Mouldings on the Plinths of the several Pedestals.

The

The BUILDER'S JEWEL.

The Divisions of Mouldings on the Plinths of Pedestals explained.

RULE I *To divide the Heights of the Mouldings on the Plinth of the Tuscan Pedestal. Plate I.*

DIVIDE the Height in 6, as at B ; give the under and upper ones to the Fillets, and the middle 4 to the *Cima recta*

RULE II *To divide the Heights of the Mouldings on the Plinth of the Dorick Pedestal. Plate X.*

DIVIDE the Height in 4 Parts, as at B ; give the upper one to the Cavetto ; half the next to its Fillet , half the lower one to the lower Fillet , and the Remains to the *Cima recta*.

RULE III. *To divide the Heights of the Mouldings on the Plinth of the Ionick Pedestal. Plate XXI*

DIVIDE the Height in 2, as at B , and each in 4 ; give the upper 1 and half to the Cavetto ; the next half to its Fillet , the next 1 to the Astragal , the lower 1 to the Fillet , and the Remains to the *Cima*.

RULE IV *To divide the Heights of the Mouldings on the Plinth of the Corinthian Pedestal. Plate XXXIX.*

DIVIDE the Height in 4, as at B ; the upper 1 and 3d downwards, each in 3 , give the upper 1 and half to the Cavetto , the next half to the Fillet , the next 1 to the Astragal ; the lower 4th to the Height of the Torus ; and one third of the next to its Fillet

RULE V *To divide the Heights of the Mouldings on the Plinth of the Composite Pedestal. Plate LVII.*

DIVIDE the Height in 4 ; and the upper and third Part downwards, each in 3 ; give the upper 2 of the upper Part to the Cavetto , the next 1 to its Fillet , the lower 4th Part to the Torus ; and one third of the next Part to its Fillet

The Division of Mouldings in the Cornices of Pedestals explained

RULE I *To divide the Heights of the Mouldings contained in the Cornice of the Tuscan Pedestal. Plate I.*

DIVIDE the Height, as at A, in 6 Parts ; give the upper 1 to the Regula , the next 3 to the Plat-band , and the lower 2 to the *Cima reversa*.

RULE

RULE II. *To divide the Heights of the Mouldings contained in the Cornice of the Dorick Pedestal* Plate X.

DIVIDE the Height, as at A, in 4, give half the upper 1 to the Regula; the next 1 and half to the Plat-band; the next 1 to the Ovolo; the upper one third of the lower 1 to the Fillet; and the remaining two thirds of the lower 1 to the Cavetto

RULE III. *To divide the Heights of the Mouldings contained in the Cornice of the Ionick Pedestal* Plate XXI.

DIVIDE the Height in 12 Parts, as at A; give the upper to the Regula; the next 2 to its *Cima reversa*, the next 3 to the Plat-band, the next 3 to the Ovolo, the next 1 to the Astragal, half the next 1 to its Fillet; and the Remains, 1 and a half, to the Cavetto

RULE IV *To divide the Heights of the Mouldings contained in the Cornice of the Corinthian Pedestal* Plate XXXIX.

DIVIDE the Height in 3, as at A, also the upper 1 in 6, the lower half of the middle 1 in 3, and the lower half of the lower 1 in 3. Of the 6 upper small Parts, give the upper 1 and one third to the Regula; the remaining two thirds and two Parts to the *Cima reversa*, and the next 1 to the Astragal. Give the last 1, and half the middle great Part, to the Plat-band; also one third of the remaining half to the Fillet on the *Cima recta*; and the remaining two thirds, and the upper half of the lower great Part, to the *Cima recta*. Lastly, give the upper 1 Part of the half of the lower Part to the Astragal, half the next to its Fillet, and the Remains to the Cavetto

RULE V *To divide the Heights of the Mouldings contained in the Cornice of the Composite Pedestal* Plate LVII

DIVIDE the Height in 6 Parts, as at A, give half the upper 1 to the Regula, the next 1 to the *Cima reversa*, the next 1 and half to the Plat-band, one third of the next 1 to the Fillet on the *Cima recta*; the remaining two thirds, and the next 1, to the *Cima recta*, one third of the last 1 to the Fillet on the Cavetto, and the remaining two thirds to the Cavetto.

THE Heights of the several Mouldings on the Plinths, and in the Cornices, being thus found; I shall proceed to shew how to give each its proper Projecture from the Upright of their Dado's.

The Projections of the Plinths, and Members on the Plinths, and in the Cornices of Pedestals, explained.

MAKE the Projection of the Plinth from the Upright of its Dado, in every Order, equal to the Height of the Mouldings on the Plinth; and make the Projection of every Cornice the same.

To find the Projections of the several Members.

DIVIDE the Projection of the *Tuscan* Plinth in 6, and of all the other Orders in 4; and then subdividing the Parts, as exhibited in the Scales of Projection, which are placed between the Base and Cornice of each Pedestal, from thence, stop, or terminate the Projection of each Member, as by Inspection is shewn; and thus are the five Orders of Pedestals compleated.

CHAP. III. Of Columns and their Parts.

A COLUMN consists of three principal Parts, *viz.* A Base, Shaft, and Capital

The Heights of Columns explained.

To find the Heights of Columns, having the Heights of the Columns and Entablatures given, these are the Rules

RULE I *In the Tuscan and Dorick Orders Plate I and X.*

DIVIDE the given Height of the Column and Entablature in 5 Parts, the upper 1 is the Height of the Entablature, and the lower 4 of the Column Divide the Height of the *Tuscan* Column in 7, and of the *Dorick* in 8, and 1 is the Diameter of the Column.

RULE II *In the Ionick, Corinthian, and Composite Orders. Plates XXI, XXXIX and LVII*

DIVIDE the given Height of the Column and Entablature in 6 Parts; the upper 1 is the Height of the Entablature, and the lower 5 of the Column Divide the Height of the *Ionick* Column in 9, and the *Corinthian* and *Composite* Columns each in 10 Parts, and 1 is the Diameter.

The

The Heights and Projections of the Bases of Columns explained.

THE Height of the Base of every Column is precisely half its Diameter next above the Base; and the Projection of the Plinth, from the Upright of the Shaft, is always equal to one 6th of the Column's Diameter.

The Height of Plinths to the Bases of Columns is either equal to half the Height of the whole Base, as in the *Tuscan* Base, Plate II. or to one third of the Base's Height, as in the *Dorick* Base on the Right-hand Side, Plate XI. And in the *Ionick*, *Corinthian*, and *Composite* Bases, Plates XXII. XLI and LVIII.

To make the Construction of Bases to Columns easy, I will explain how to divide the Heights, and terminate the Projections of the Members contained in the *Tuscan* and *Dorick* Bases, by which those of the *Ionick*, *Corinthian*, and *Composite* will be understood, as being no more than Repetitions of the like Rules

RULE I. *To divide the Heights, and terminate the Projections of the Members contained in the Base of the Tuscan Column* Plate II.

I *To determine their Heights*

DIVIDE the Height in two, and give the lower 1 to the Plinth as aforesaid Divide the upper 1 in 4, give the lower 3 to the Torus, and the upper 1 to the Cincture

II *To determine their Projections*

DIVIDE the Projection of the Plinth, from the Upright of the Shaft in 4 Parts, and the second Part in 4; then 1 Part and 3 fourths of the second, stops the Cincture, and the Torus is always in every Order the same Projection as the Plinth.

RULE II *To divide the Heights, and terminate the Projections of the Members contained in the Attick Base to the Dorick Column, on the Right-hand Side of* Plate XI

I *To determine their Heights.*

DIVIDE the Height in 3 Parts, the middle Part in 4, and the upper Part in 2 Give the lower 1 Part to the Plinth, as aforesaid; three fourths of the next to the lower Torus, and half the upper 1 to the upper Torus. Divide the Remainder between the two

B

Torus's

Torus's in 6 ; give the upper and lower ones to the two Fillets ; and the middle 4 to the Scotia.

II. *To determine their Projections.*

DIVIDE the Projection of the Plinth in 4 Parts, and the 2d and 3d Parts in Halves : From whence perpendicular Lines being drawn up, will terminate the Cincture, and the two Fillets of the Scotia.

RULE I *To describe the Curve of this Scotia*

DIVIDE the Height in 3 Parts, as at B, and draw the Lines $c b z$ and $a b$ On b , describe the Quadrant $a c$; and on the Point z , the Arch $c d$, which together form the Curve of the Scotia to the Attick Base

I will also now shew how to describe the Scotia in the Ionick, Corinthian, and Composite Bases, as expressed at large by Figure A. Plate XLI.

DIVIDE the Height $b g$ in 7 Parts ; from the third Part draw $f c$ parallel to the Fillets, and equal to 3 Parts, thro' the Point f draw the Line $a c$ parallel to $b g$, and make $f a$ equal to 4 Parts of $b g$. Draw $a c$, and then, on the Point c , describe the Arch $b x d$, and on a the Arch $d e$

HAVING thus explained the Bases, or first Parts of Columns, I shall now proceed to the second Parts, which is their Shafts.

THE Shaft of a Column is that Part which is contained between its Base and Capital ; and consists of 3 Parts, viz its Cincture, Trunk, and Astragal ; excepting in the *Tuscan*, where the Cincture is made a Part of the Base to the Column.

To render the Shafts of Columns agreeable to the taper Growth of the Trunks of Trees, (with which the first Columns were made) their Shafts, or rather their Trunks are therefore diminished from the lower third Part up unto the Astragal, as following

The Shafts of Columns, and their Diminution explained.

RULE *To diminish the Shafts of a Column.* Plate I. Fig. A.

SET up the Shaft's Height ; at $z k$, its Astragal, set off its diminished Dimeter, viz. three fourths, as being *Tuscan*. Compleat the lower third undiminis'd Part of the Shaft, and on $a d$ its upper Part.

Part describe the Semicircle $abc d$. From ik , draw the Lines ib , kc , parallel to bn the central Line, cutting the Semicircle in b and c . Divide the Arches ab and cd , each into any same Number of Parts; suppose 4; and divide bn into the same Number of Parts also, as at the Points gfe ; through which draw right Lines at right Angles to bn of Length at Pleasure. From the 4 Divisions in the Arch ab , to those in the Arch cd , draw Ordinates (as those dotted) Make the Diameter of the Shaft at c , equal to the Length of the first Ordinate; at f , to the Length of the second Ordinate; and at g , to the Length of the third Ordinate. Then from the Points ik , through the Extremes of the Diameters gfe , to the Points ad , trace the Contours or Out-lines of the Shaft's Diminution.

The Manner of Rusticating the Shafts of Columns explained

THE Shafts of the *Tuscan*, *Dorick*, and *Ionick* Columns, are sometimes rusticated; but those of the *Corinthian* and *Composite* seldom or ever.

RULE. *To rusticate the Tuscan, Dorick, and Ionick Shafts*

DIVIDE the Height of the *Tuscan* in 7, as in Plate I the *Dorick* in 8, as in Plate X and the *Ionick* in 9, as in Plate XXI; then the Blocks and Intervals in the *Tuscan* and *Ionick* will each be 1 Diameter, and those of the *Dorick* 2 Diameters.

THE Projection of the Blocks are generally made equal to the Projection of the Plinth, as expressed in the *Tuscan* Order, Plate I. and continued upright without Diminution, but as the upper Parts of the Shafts seem thereby overcharged, I therefore recommend the Diminution to be parallel with the Shaft, as in the *Dorick* Order, Plate X.

The Manner of Fluting the Shafts of Columns explained.

THE Shafts of the *Dorick*, *Ionick*, *Corinthian*, and *Composite* Columns are sometimes fluted and cabled, but the Shaft of the *Tuscan* Column seldom or ever was, as being an Embellishment too gaudy for so robust and simple an Order, whose Beauty consists in its native Plainness, and indeed all Columns have a grander Aspect

when entirely plain, than when rusticated or fluted The *Dorick* Shaft, with respect to its *Herculean* Aspect, should not be fluted ; but as the Ancients dispensed therewith, the Moderns frequently do the same But however, as herein Majesty must be preserved, therefore the Ancients allowed but 20 Flutes, and those without Fillets, as in the Left-side of Plate XI. thereby making them of a masculine Aspect ; whilst those of the *Ionick* and *Corinthian* Shafts are charged with 24 Flutes, and as many Fillets (each of which are equal to one third of a Flute) which renders them less capacious and of an effeminate Aspect, agreeable to the Characters of those Orders

RULE To divide the Flutes of a *Dorick Column* Plate XI

DIVIDE the Circumference into 20 equal Parts, and draw Lines, thereby making a Polygon of 20 Sides, on each Side compleat an equilateral spherical Triangle, as $a b c$ on the Left of Plate XI and on the external Angle, as b , describe the Curve $a c$, which is the Depth or Sinking-in of a Flute

RULE To divide the Flutes and Fillets of an *Ionick, Corinthian, or Composite Column* Plate XXV.

DIVIDE the Circumference of the Semi-Column in 12 Parts, and each Part in 8, as $a b$. Give 3 Parts to each Semi-Flute, as $a b$, and 1 b , and two Parts to each Fillet, as $b i$

THE Sinkings or Depths of these Fillets are either the Arch of a Quadrant, as those on the Right-hand described on the Centers $c e$, &c or of a Semi-circle, as those on the Left, described on the Centers x , &c

RULE To describe Cablings, in the Flutes of a Column Plate XXV

On the Points xx , with the Radius xv , describe the Arches $yx o$, $y x o$, &c which are the Bases of the Cablings, and whose Height finishes at the first third Part of the Shaft's Height

RULE To set out Flutes and Fillets on the Shaft of a Column. Plate XXVI

On a Pannel, &c draw a right Line, as $a b$, and thereon set off
24 equal

24 equal Parts at Pleasure, which together must always be less than the Girt at the Astragal of the Column to be fluted.

DIVIDE any 1 Part in 4 Parts, and take 1 Part in the Compasses, and set it off in every of the other 23 Parts, and from the several Parts so divided (which will be to one another as 1 to 3, that is, a Fillet to a Flute) draw up right Lines at right Angles from the divided Line. This done, strike a perpendicular Chalk-Line down the Front of the Column. And being provided with two straight-edged Pieces of Parchment, &c. therewith girt the Column at its Base, and at its Astragal. Apply the Girts so taken to the parallel Lines aforesaid, so that their Extremes shall just touch the two outer Parallels, as at *e c* and *d f*. Then keeping them there, with a Pencil mark their Edges at the Meeting of each Parallel; and thereby the two Girts will be divided into the Flutes and Fillets, agreeable to your Column to be fluted. This done, apply any End of each of the Parchment Girts to the Bottom and the Top of the Front central Line, and then embracing the Column at its Base and Astragal, remove each Girt, until you bring the Middle of a Flute on the central Line, and then prick off the Breadth of every Flute and Fillet in the two Girts, which will stand exactly perpendicular over each other.

Note, In large Columns it may be necessary to set out the Breadths of the Flutes and Fillets, in one or more Places, between the first third Part of the Shaft's Height and the Astragal, which, when required, may be most exactly done, by girting at the Parts required, and proceeding afterwards in every other respect, as aforesaid.

The Fluting of Pilasters explained

RULE. To flute a Pilaster with Fillets, and a Bead at each Quoin Plate XXXVII

DRAW a Line at Pleasure, as *a b*, and thereon set 31 equal Parts, which together shall be greater than the Pilaster to be fluted. Take the 31 Parts in your Compasses, &c. and on the first and last Points make the Section *c*, and draw the Lines *c a* and *c b*, which will compleat an equilateral Triangle. Set the Breadth of the Pilaster from

from *c* to *d*, and to *e*, and draw the Line *de*, which being parallel to *ab*, is therefore equal to the Breadth of the Pilaster. Now right Lines drawn, from the 31 Parts, to the Point *c*, they will divide the Line *de* in similar 31 Parts also. Of which give the 2 outer Parts to the two Beads at the Quoins; the next 2 outer ones to the 2 outer Fillets, the next 3 to the Breadth of a Flute, the next 1 to a Fillet; the next 3 to a Flute; the next 1 to a Fillet, &c.

Note, By the same Rule a Pilaster with Flutes and Fillets only, as Fig. A, is divided from 29 Parts, first set off at Pleasure, and then proceeding as before.

HAVING thus explained the Bases and Shafts of Columns, &c I shall now proceed to their Capitals

Or Capitals, there are two Kinds, *viz* the one consisting of Mouldings only, as those of the *Tuscan* and *Dorick*; and the other of Mouldings and sculptured Ornaments, as the *Ionick*, *Corinthian*, and *Composite*.

The Heights of Capitals explained.

THE Height of the *Tuscan* and *Dorick* Capitals are each precisely a Semidiameter, as in Plates II and XI The Height of the ancient *Ionick* Capital, in its Mouldings above the Astragal of the Shaft, is but one third of a Diameter, or 20 Minutes, but including the Depth of its Volute, 'tis 35 Minutes, as in Plate XXIII. which exceeds the Volute to the modern Capital by 5 Minutes. The Height of the *Corinthian* Capital is one Diameter and one sixth, as also is the Height of the *Composite* Capital

The Divisions and Projections of the Members in the Tuscan and Dorick Capitals explained Plates II. and XI.

RULE I. To divide the Heights, and determine the Projections of the Members in the Capital of a *Tuscan* Column or Pilaster.

I To divide the Heights of the Members Plate II

DIVIDE the Height in 3 Parts (as on the Left-side) Divide the middle 1 in 6; of which give the lower to the Fillet under the Ovolo, and the other 5 to the Ovolo Divide the upper 1 into 4; give the upper 1 to the Fillet, and the other 3 to the Fascia of the

the Abacus. Set down *ab*, half the Height of the Frize or Neck of the Capital, from *b* to *c*, and divide it in 3 Parts, give the upper 2 to the Astragal, and the lower 1 to its Fillet.

II. *To determine the Projections*

DIVIDE the Semi-diameter of the Column at its Astragal (as is done above on the Capital) in 6 Parts, and give 3 to the Projection of the upper Fillet

BUT if the Capital is of an undiminished Pilaster, (as on the Right-hand Side of Plate II) then divide the Semi-diameter of the Pilaster (as above on the Capital) in 8 Parts, and give 3 to the Projection, as before.

Note, By the Scale of Projection, placed against the Neck of the Capital, you see that the whole Projection is divided in 3, the first 1, in 2, and the last 1, in 4, the half of the first 1 stops the Projection of the Fillets under the Astragal and Ovolo, and the 2 first of the 4, in the outer 1 third Part, stops the Ovolo and Fascia of the Abacus

RULE II *To divide the Heights, and determine the Projections of the Members contained in the Capital of a Dorick Column or Pilaster. Plate XI.*

I. *To divide the Heights of the Members*

DIVIDE the Height in 3 Parts (as on the Left-side) Divide the middle 1 in 3, of which the lower 1 divided in 3, give the upper 2 to the Astragal, and lower 1 to the Fillet Divide the upper 3d Part in 3, give the lower 2 to the Fascia of the Abacus; and the upper 1 thereof divided in 3, give the upper 1 to the Fillet, and the lower 2 to the *Cima reversa*

Note, THE Height of the Astragal to the Shaft is found, as before in the *Tuscan Column*, Page 11.

II. *To determine their Projections*

DIVIDE the Semi-diameter of the Column at its Astragal (as above on the Capital) in 4, and give 2 to the Projection of the upper Fillet BUT if the Capital is of an undiminished Pilaster, (as on the Right-hand Side) then divide the Semi-diameter of the
Pilaster

Pilaster (as above on the Capital) in 5 Parts, and give 2 to the Projection, as before.

By the Scales of Projection on each Side of the Capital, you see, that the whole Projection is there divided in 4 Parts; from which, and their Sub-divisions, the several Members in the two Varieties of Capitals have their Projections determined

The ancient Ionick Capital, and its Volute explained. Plate XXIII

RULE I. To divide the Height of its Members, and describe its Volute.

I *To divide the Height of its Members.*

DIVIDE the given Height as kx , in 11 Parts; give the upper 1 to the upper Fillet, the next 2 to the *Cima reversa*, which with the aforesaid Fillet makes the Abacus give the next 1 to the List of the Volute; the next 3 to the Band of the Volute; and the remaining 4 to the Ovolo. This done, set down 8 of the above 11 Parts from x to I, give the first 2 to the Astragal, the next 1 to its Fillet; and the lower 5 to the Depth of the Volute. Divide rs on the Right-hand (which is equal to kx , or 20 Minutes, the Height of the Mouldings of the Capital) in 4 Parts, and turn down 1 Part to d , then rd will be equal to 25 Minutes, which is equal to the Semi-diameter of the Column at its Shaft. Now admitting bv to be the central Line of the Column, make vc equal to rd , and draw the Line ecb , which will be the Upright of the Column. Make bg equal to two thirds of $a1$, the Height of the Astragal; and from the Point g draw the Cathetus or Line fg , parallel to the central Line. Divide gb in 4 Parts; the first 1 stops the Astragal at a . Make fn equal to $f1$, which will terminate the Projection of the Abacus

RULE II *To describe the Ionick Volute* Plate XXIII

FROM 1 Part below x , draw the Line $p m o$ for the central Line of the Astragal, intersecting the Cathetus fg in o . On the Point o , with the Radius oz , describe the Circle or Eye of the Volute (which is represented at large by the Figure R,) wherein inscribe the Geometrical Square, and draw its Diameters 2, 4; and 1, 3, divide each

each Semi-diameter in 3 Parts, as at the Points 6 10, 5 9; 12 6; and 11 7; which are the Centers numbered in Order, on which the Out-line of the Volute is described, *viz.* The Point 1 is the Center to the Arch *z m*, the Point 2, of the Arch *m g*; the Point 3, of the Arch *g p*, &c

THE inward Line of the List of the Volute is described on 12 other Centers, which are at one fifth of the Distance between the other 12 Centers, and which are signified by the small Divisions next within the 12 Centers in the Eye of the Volute at large, in Plate XXII.

To gradually diminish the List of this Volute, we must divide its Height or Breadth in 12 Parts, as expressed above, in Plate XXII and at every Quarter of its Rotation abate its Breadth 1 of those Parts, as expressed by the numerical Figures affixed, which will cause it to terminate at the Eye in a Point.

Note, FIG. A B, Plate XXIII. is a View of half a Side of the Capital, wherein B shews the Thickness of the Volute, whose Height is equal to *1 g* in the Front The Heights of the other Parts are shewn by the Scale of Parts on the Left; and is the same as the like Scale above.

Note, THE Abacus to this Capital being square, is therefore called by Workmen a *Trencher-Capital*, and indeed very properly, because the Word *Abacus* is derived from the Greek Word *Abax*, signifying a square Trencher

The modern Ionick Capital explained Plate XXIV.

RULE To divide the Heights of the Members contained in its Abacus, and to determine their Projections

THIS Capital, tho' called Modern, was invented by VINCENT SCAMMOZZI; and, including its Volute, is precisely half a Diameter in Height.

I. To find the Heights of the Members

DIVIDE its Height in 3 Parts, and the upper half of the upper 1 in 4, as on the Left; of which give the upper 3 to the Ovolo, and the other 1 to the Fillet under it Divide the lower 2 Parts

C

and

and half in 8 Parts (as on the Right,) give the upper 1 and half to the Fascia of the Abacus; the next half to the Recess under the Abacus; the next 2 to the Ovolo, the next 1 to the Astragal; and the next half to its Fillet.

II. *To find the Projections of the Members.*

DRAW the central Line of the Column bg ; and in any Place, as at g , draw the Line ab at right Angles to bg , and of Length at Pleasure. Make gc and gd , each equal to the Semi-diameter k ; and divide it into 12 Parts, each representing 5 Minutes (or one 12th of a Diameter,) make ca and db , each equal to 15 Minutes, or one fourth of a Diameter, which terminates the Projection of the extreme Parts or returned Horns of the Abacus; as exhibited by the dotted parallel Lines drawn thence up to them.

AND from the Subdivisions of the 2 outer 5 Minutes, the Projections of the other Parts of the Abacus are determined in the same Manner; as also are the Projections of the Ovolo, Astragal, and Fillet, represented by dotted Lines within the Volute.

THE Volute of this Capital is represented in Plate XXII and is described the same as that of the ancient Capital; for though it appears to be elliptical when seen in a direct View, as being thereby something fore-shortened, yet 'tis circular, as the other.

UNDER this Capital I have placed half its Plan, whose Construction being plainly exhibited by the dotted perpendicular Lines, proceeding from the Members in the Elevation, needs no further Explanation.

The Corinthian Capital explained. Plate XLI

THIS Capital was originally adorned with the Acanthus Leaves only, but as some delight in Variety, I have therefore in Plate XL given the Acanthus with the Olive, Laurel, and Parsley, to be employed at Discretion.

THE Height of this Capital was originally but 1 Diameter; but modern Architects thinking it too short, they therefore added 10 Minutes, thereby making its Height 70 Minutes, and giving it a much more magnificent Aspect than it had before.

By the Measures affixed, which is no more than the Height divided in 7 Parts, of which the upper 1 is the Abacus, the Height of every Part is adjusted ; and by the Plan and Elevation in Plate XLII the Breadths and Distances of the Leaves, &c. are fully exemplified in the like Manner

In the Drawing of this Capital, the young Student must first accustom himself to express only the Leaves in gross, as expressed in this and the XLIVth Plate, until he has made himself a Master of forming their Out-lines, when it will be a Pleasure to raffle them, as expressed in Plate XLIII and XLV

AND as the Capital of a Pilaster has all its Leaves in each Face in a direct View, contrary to those of a Capital to a Column, and is one sixth of a Diameter more in Breadth ; I have therefore, to explain the Difference and Parts, shewn in Plate XLIV the Plan and Elevation of a Capital to a Pilaster, in the same Manner as that of a Column in Plate XLII as indeed I have also the Elevation of a half Capital at large, with its Leaves raffled, as those of Plate XLIII

The Composite Capital explained. Plate LVIII

THIS Order is called *Composite*, because its Capital is composed of the *Ionick* and *Corinthian* Capitals, that is, its Abacus, Volutes, Ovolo, and Astragal between them, are the very Members which form the Modern *Ionick* Capital. Its two Heights of Leaves are the very same as those in the *Corinthian* Capital ; and its Stalks, which in the *Corinthian* Capital finish with Volutes and Helices, are here stopt by the *Ionick* Volutes, and made to finish inwardly with Husks on Tendrels, called Caulicole's

THE Height of this Capital is the same as that of the *Corinthian*, and is divided in 7 Parts also, of which the upper 1 is the Height of the Abacus ; and which being divided in 2, and the upper 1 in 5, the upper 4 is the Height of the Ovolo, and the lower 2 of the Fillet Divide the lower half of the Height of the Abacus with the next two Parts into 1, and then finish the Volute exactly the same, as in the Modern *Ionick* Capital, Plate XXIV

Now, as the remaining Part of this Capital is entirely *Corinthian* as before proved, tis needless to say more thereof; but that it may be fully exemplified, I have therefore shewn its Elevation at large in Plates LIX and LX as well for a Pilaster, as for a Column; as I have done before in the *Corinthian* Order.

CHAP IV. Of Entablatures.

AN Entablature is the uppermost or last principal Part of an Order, (which *Vitruvius* called *Ornament*) and consists of 3 Parts, *viz* an Architrave, a Freeze or Frize, and a Cornice.

THE Heights of Entablatures being declared in Chap I we are now to observe that their Projections are equal to their Heights, in all the Orders, excepting the *Doric*, and that only but when its Mutules are introduced, when it then consists of half the Entablature's whole Height.

THE Heights of the several Entablatures are thus divided into their Architraves, Friezes, Cornices, &c

RULE I To divide the *Tuscan* Entablature into its Architrave, Frize, Cornice, &c Plate III

First, DIVIDE the given Height into 7 Parts; give 2 to the Architrave, 1 to the Frize, and 3 to the Cornice.

Secondly, DIVIDE the Height of the Architrave in 7 Parts, give 2 to the lower Fascia, 4 to the upper Fascia, and 1 to the Tenia, whose Projection is equal to its Height, and which being divided in 3, give 1 to the Projection of the upper Fascia

Thirdly, DIVIDE the Height of the Cornice in 3, divide the upper 1 in 4, and give the upper 1 Part to the Regula, and the other 3 to the *Cima recta* Divide the middle 1 in 6, give the upper 1 to the Fillet, and the other .5 to the Corona Divide the lower 1 in 2, give the upper 1 to the Ovolo, and the lower half divided in 4, give the upper 1 to the Fillet, and the other 3 to the Cavetto.

By the Scale of Projection is seen, that the Projection of the Corona is two thirds, the Ovolo, one third, and the Fillet of the Cavetto, one sixth of the whole.

Note,

Note, By well understanding the Manner of proportioning this Entablature, (which is very easy) the others following will become as easy. But that the young Student may not be at any stand therein, I will, for a further Explanation, explain the Entablatures of the *Dorick* and *Ionick* Orders in the same Manner.

RULE II *To divide the Dorick Entablature into its Architrave, Frize, Cornice, &c* Plate XII.

First, DIVIDE the Height in 8 Parts; give 2 to the Architrave, 3 to the Frize, and 3 to the Cornice.

Secondly, DIVIDE the upper 1 of the Architrave into 3, and give the upper 1 to the Tenia. Divide the lower 2 in 6, give the upper 1 to the Fillet over the Gutta's, and the next 3 to the Gutta's.

DIVIDE the lower third Part of the Height of the Cornice in 3, and give the lower 1 to the Cap of the Triglyph. Divide the remaining Part of the Cornice's Height in 4 Parts, and the upper 1 Part in 4, of which give the upper 1 to the Regula, or upper Fillet on the *Cima recta*; and the lower 3 to the *Cima recta*. The next Part divided in 3, half the upper 1 is the Fillet, and the Remainder the Corona. The next Part being also divided in 3, the upper 1 is the Capping of the Mutule, and the lower 2 the Mutule. Lastly, the lower 4th Part divided in 3, the upper 1 is the Depth of the Ground to the Mutules, and half the lower 1 is the Fillet to the Ovolo of the Bed-mould.

THE Projection of this Cornice (as before observed) is half the Height of the whole Entablature, and which being divided in 4, as on the *Cima recta*, has the Projections of its Members determined, as by Inspection is shewn.

Now 'tis to be noted, That the Breadth of a Triglyph is always equal to half the Column's Diameter at its Base, that its Channelings and Gutta's are found by dividing the Breadth of the Triglyph into 12 Parts, as exhibited at large in Plate XIII. That the Distances between the Triglyphs must always be equal to the Height of the Frize, and therefore will become exactly square. That these Intervals or Squares are called Metopes, and are sometimes enriched

with

with Roses, as here expressed, or otherwise at the Pleasure of the Architect; and that the Manner of forming the Planceer of this Cornice is shewn in Plate XIV.

RULE III. *To divide the Ionick Entablatures into the Architrave, Frize, Cornice, &c.*

As this Order has two Varieties of Entablatures, *viz* the one with Dentules, and the other with Modillions; I have therefore shewn them both, and by explaining of one, the other will be understood

To divide the Ionick Entablature with Dentules Plate XXVIII

First, DIVIDE the Height in 10 Parts, give 3 to the Architrave, 3 to the Frize, and 4 to the Cornice.

Secondly, DIVIDE the upper 1 Part of the Architrave in 4, give the upper 1 to the Fillet, the next 2, and 1 fourth of the lower 1, to the *Cima reversa*; and the remaining 3 fourths of the lower 1 to the Bead. These Members together are called the Tenia of the Architrave, whose Fillet's Projection is equal to their whole Heights.

Thirdly, As the Frize of this Order is made swelling, therefore divide the Height in 4, and on the middle 2 make the Section *x*, on which describe the Curve of the Frize.

Fourthly, THE Height of the Cornice being in 4 Parts, divide the upper 1 in 4, give the upper 1 to the Regula or Fillet on the *Cima recta*, and the remaining 2, with 2 thirds of the lower 1, to the *Cima recta*, and the 1 third give to the Fillet on the *Cima reversa*.

DIVIDE the next Part in 4; give the upper 1 to the *Cima recta*, and the other 3 to the Corona

DIVIDE the next or 3d Part in 6, give the upper 3 to the Ovolo, the next 1 to its Fillet, and the next 1 to the Fillet between the Dentules.

DIVIDE the lower 1 in 3, the upper 1 will terminate the Depth of the Dentules. Divide the middle 1 in 3, and the upper 1 will be the Depth of the Denticule or Fascia, on which the Dentules
are

are fixed, and the Remains will be the *Cima reversa*, and lower Member of the Entablature.

THE Projection is divided into 4 principal Parts, as by the Scale against the Frize is shewn, by which its Members are terminated, as by Inspection is plain.

To divide the Ionick Dentules

IN an Entablature over a Column, divide the Distance between the central Line, and the Upright of the Shaft at its Neck, into 10 Parts, give 2 Parts to the Breadth of a Dentule, and 1 to an Interval. But in an Entablature over an undiminished Pilaster, divide the aforesaid Distance into 17 Parts, and proceed as before.

Note, THE Breadth of a Dentule is 5 Minutes, and of an Interval 2 Minutes and a half, which are described at large in Plate XXX.

Now, as the *Ionick* Entablature with Modillions, as expressed in Plate XXIX has its Members proportioned in like Manner, I therefore need only to note, That the Breadth of each Modillion is 10 Minutes, that the Distance or Interval between them is 25 Minutes in an Entablature to a Column, and 30 Minutes in an Entablature to an undiminished Pilaster. And that the Curve of the Sophete of the *Ionick* Modillion is described at large in Plate XXX as following.

The Height and Projecture being before found,

DIVIDE the Length in 6 Parts; and on the Point 5 erect the Perpendicular 5 *a* equal to 2 Parts and a half; also from the Point 2, let fall the Perpendicular 2 *b*, equal to 1 Part and a half, and draw the Line *a b*. On the Point 2, describe the Arch 1 *d*, on the Point *b*, the Arch *d c*, and on the Point *c*, the Arch *c 5*.

Note, THE Manner of forming the Return of the Planceer of this Cornice, is shewn in Plate XXXI.

RULE III *To divide the Corinthian Entablature into its Architrave, Frize, and Cornice* Plate XLVI

1. DIVIDE the Height into 10 Parts, give 3 to the Architrave, 3 to the Frize, and 4 to the Cornice

2. DIVIDE the Height of the Architrave, and of the Cornice, each in 5 Parts, and subdivide them as exhibited; and then proceed in every Respect as in the preceding Orders.

Note,

Note, THAT tho' the Dentules are expressed in this Cornice, yet they are not always used.

THAT the Breadth of the Modillions are 10 Minutes, as before in the *Ionick*, but their Distances are greater.

THE Interval between Modillions in a Cornice over Columns is 25 Minutes; and in a Cornice over undiminished Pilasters, 30 Minutes.

To render the Parts of this Modillion plain and intelligible, I have shewn it at large in Front and Profile, with its Measures, in Pl XLVII wherein Fig. A represents the Eye of its Volute at large, with the Centers numbered, on which its Curves are described in the very same Manner, as the Volute of the *Ionick* Capital.

BETWEEN the Modillions the Planceer of the Sophete of the Corona is enriched with Roses in hollow Pannels, called Coffers, as expressed in Plate XLVIII. which also shews the Manner of returning the Sophete at an external Angle

RULE IV *To divide the Composite Entablature into its Architrave, Frize, and Cornice.* Plate XLI

First, DIVIDE the Height into 10 Parts; give 3 to the Architrave, 3 to the Frize, and 4 to the Cornice

Secondly, DIVIDE the Heights of the Architrave, and of the Cornice, each into 4, subdivide their Parts, draw in and terminate their Members by the Scale of Projection, as before done in the preceding Orders. The Manner of enriching the Planceer of the Corona of this Cornice, and returning it at an external Angle, is exhibited in Plate LXII

CHAP. V. *Of Doors, Windows, Portico's, Arcades, and the Intercolumnation of Columns in general.*

THAT the Young Student may have Pleasure in the Process of his Study, I have given him an Example of a Door square and circular-headed, with circular and pitched Pediments, a Window, a Portico, and an Arcade, with their Imposts and Architraves, in each of the first 4 Orders; which immediately follow their respective

spective Entablatures ; and which having their principal Parts determined by their Measures affixed, needs no other Explanation. And in order to further enable him in the Art of Designing, I have shewn the proper Intercolumnations, or just Distances, that the Columns of every Order must be placed in from each other, when employed in Colonades, &c by which he may form new Designs at his Pleasure. See Plates VI, XVII, XXXIV, XXXV, and LIII.

CHAP. VI *Of Pediments, and the Manner of finding their Raking and Returned Mouldings for their Cornices, and for Capping of their Raking Mutules and Modillions.*

PEDIMENTS, which the *French* call *Frontons*, from the *Latin* *Frons*, the Forehead, are commonly placed over Windows, Doors, Portico's, &c. to carry off the Rains, and to enrich the Order on which they are placed.

PEDIMENTS are either entire or open ; and those are straight, circular, compound, &c.

AN entire straight Pediment is generally called a pitched Pediment, as the lower Pediment in Plate LXIX. And an entire circular Pediment is generally called a Compass Pediment, as the upper Pediment in Plate LXIX.

WHEN a Pediment consists of more than one Arch, as those in Plates LXXI, and LXXII, they are called entire compound Pediments.

OPEN Pediments are those, whose raking Members are stopt in some certain Place between the Points of their Spring, and their Fastigium or vertical Point ; as those in Plate LXIII, the lower Pediment in Plate LXXI, and the upper in Plate LXXIV.

ENTIRE Pediments are the first Kind that were made, and were originally placed to Portico's at the Entrances into Temples ; but now we place them to Frontispieces of Doors, Windows, &c. for Ornament and Use.

As the entire Pediment by its reclining Surfaces carries off and discharges the Rains at its Extremes, therefore none but entire Pedit-

ments should be employed abroad ; whilst the broken or open are employed for Ornament only within-side, where no Rains can come.

'Tis true we may daily see open Pediments placed without-side, as is done by *Inigo Jones* at *Shaftsbury House* in *Aldersgate-street, London* But, surely, nothing can be so absurd, (unless it is the placing of an entire Pediment within side a Building, where no Rains can fall; as done by *Mr. Gibbs* within the Church of *St. Mary le Strand*) because, by their being open, they receive the Rains, and discharge them in Front, as a straight and level Cornice doth, and therefore of no more Use.

As Pediments, when well applied, are very great Enrichments to Buildings, and in many Cases are very useful, I have therefore given 14 Varieties for the young Student's Practice, with their Measures affixed; by which they may be drawn and worked of any Magnitude required. *Vide Plates LXIX, &c.*

IN the Working of Pediments, the chief Difficulty is, to form the Curves of the Raking and Returned Cornices, that shall exactly accadeer, or meet at their Mitres; which may be truly worked, as following.

RULE. To describe the Curve of the Raking *Cima recta* of a Pediment, having the Curve of the straight or level Cornice given. Plate LXV.

LET *abg* be the given *Cima recta*; divide its Curve in 4 equal Parts at the Points *d e f*, and draw the Ordinates *if, ke*, and also *dg*, from the Points *d e f*, draw the raking Lines *f q, er, dx*; and the perpendicular Lines *dk, el, fm*. In any Place, as at *no*, draw a right Line at right Angles to the raking Lines, and making the Ordinates in Fig. B, as *w q, nr, ts*, equal to the Ordinates *if, ke, gd*, in Fig. A, through the Points *q r s*, trace the Curve *p q r s n*; which is the Curve of the Raking *Cima recta* required And tho', strictly speaking, each half is a Part of an Ellipsis, yet, if Centers be found that shall describe the Arch of a Circle to pass through the three Points *p q r*, and *r s n*, it will not be in the Power of the most inquisitive Eye to discover the Difference

To describe the Curve of the Returned Cornice.

FROM *p*, Fig. C, set back *p o*, the Projection *b g* in Fig. A, and draw the Perpendicular *on*, on the Top of the Fillet *p o*; make the Distances *pt*, *t v*, *v w*, equal to the Distances *b k*, *k l*, *l m*, in Fig. A; and drawing the Lines *w x*, *v r*, *t g*, parallel to the Perpendicular *on*, they will cut the Raking Lines in the Points *q r s x*. From the Point *p*, thro' the said Points to *n*, trace the Curve *p q r s x*, which is the Curve of the Returned *Cima recta*, as required; for its Ordinates at those Points are equal to the Ordinates in Fig. A.

By the same Rule, the Curves of the Raking and Returned Ovolos, Plate LXVI, the Raking and Returned Cavetto's, Plate LXVII, and the Raking and Returned *Cima reversa*, for the Capping of Raking Mutules and Modillions, Plate LXVIII, are found, as is evident to the first View.

CHAP VII. *Of Block and Cantaliver Cornices, Rustick Quoins, Cornices and Coves, proportioned to Rooms of any Height, Angle-Brackets, Mouldings for Tabernacle-Frames, Pannels and Centering for Groins.*

I OF Block Cornices I have given three Varieties in Plate LXXV, where I have first shewn them in small, to express the Breadth of their Block-Trusses, and Distances at which they are to stand, as likewise the Manner of applying them over Rustick Quoins; and secondly, at large, the better to express the Division of their Members

II. IN Plate LXXIX, I have given an Example of a Cantaliver Cornice at large, which in lofty Rooms under a Cove has a very grand and noble Effect. The Breadth of a Cantaliver is one 4th of its Height, which is equal to the Height of the Prize; and the Distance they are placed at is the same as their Height, thereby making them Metopes exactly a geometrical Square, as in the *Dorick Order*.

III. COVES to Cielings are of various Heights; as one third, one fourth, one fifth, one sixth, two sevenths, two ninths, &c. of the whole Height.

A Cove of one third, as Fig. A, Plate LXXXI, is best for a lofty Room; and when Windows are made therein, the Groins make a very agreeable Figure, and take off the seeming Heaviness which an entire Cove of a large Height imposes on the Eye

THE Curve of this Cove $x b$ is a Quadrant of a Circle described on the Center e ; as also is the Curve $a c$ of the same Radius described on the Center b . To find the Center b , after having set out the Distances of the Columns at 9 Diameters and a half, and described the Cove $x b$, as aforesaid, make $d b$ equal to $a d$.

A Cove of one fourth, as Fig. A, Plate LXXIX, is also fit for a lofty Room, as a Hall, Salon, &c. which is thus proportioned. Divide the Height in 20 Parts, give 5 to the Cove, and 2 to the Entablature.

To describe an Angle-Bracket for any Cove, suppose for Fig. B

LET $a b c$ be a Front-Bracket, and $a f$ the Base over which the Angle-Bracket is to stand. In C draw Ordinates from its Curve to its Base $a n$, at any Distances, and continue them till they meet $a f$ the Base of the Angle-Bracket, from whence raise Ordinates at right Angles to the said Base; and making them respectively equal to those in Figure C, through their Extremes trace the Curve $a n s$, which is one Quarter of an Ellipsis, and the Curve of the Angle-Bracket required

A Cove of one 5th, as Fig. I, Plate LXXIX, is fit for a Room of State, and thus proportioned, *viz.* Divide the Height in 5. give 1 to the Cove, and one third of the next to the Cornice, which is *Dorick* without Mutules, and represented at large by Fig. H

A Cove of one 6th, as the two Coves in Plate LXXX, is fit for Dining-Rooms, &c. and is thus proportioned. Divide the Height in 30 Parts; give 5 to the Cove, and 1 to the Cornice

A Cove of two 7ths, as Fig. B, Plate LXXXI, is fit for a Study or Bed-chamber, and even for a Hall, as herein expressed, and is thus proportioned. Divide the Height in 7; give 2 to the Cove, and 1 to the Entablature, which is *Dorick*.

IV. IN Plate LXXVI, I have shewn how to proportion the *Tuscan, Dorick, Ionick, &c.* Cornices to the Height of any Room; a Work known, or at least practised but by few

I. *To proportion the Tuscan Cornice to a Room of any Height.*

DIVIDE the Height from the Floor or Dado in 5, and the upper 1 in 5, of which give 3 to the Height of the Cornice, and 2 to the Breadth of its Stile and Height of its Rail, Fig A.

II. *To proportion the Dorick Cornice to a Room of any Height,*
Fig B.

DIVIDE the Height in 4, and the upper 1 in 10, of which give 3 to the Height of the Cornice, and 2 to the Breadth of its Stile and Height of its Rail

III. *To proportion the Ionick, Corinthian, or Composite Cornices to the Height of any Room, Fig C*

DIVIDE the Height in 3, and the upper 1 in 5; of which give the upper 1 to the Height of the Cornice, and 3 fifths of the next 1 to the Height of the Rail, and to the Breadth of the Stile.

V. IN Plate LXXVII, I have given eight different Mouldings for Pannels; and in Plate LXXVIII, four different Mouldings for Tabernacle-Frames, with proper Enrichments, and their Measures affixed; by which they may be drawn and worked, of any Magnitude required

VI. IN Plate LXXXII, I have shewn the Manner of finding the Curves of the necessary Ribs for Groins, by one general Rule, as follows.

IN Fig A, let $abcd$ be the Plan, and the Semi-circle acb an End Rib, and cf its Height Draw the Diagonal ad , as also the Ordinates $1\ 2\ 3\ 4$, on the Semi-circle Rib, which continue till they meet the Diagonal, in the Points $5\ 6\ 7\ 8$, from whence raise eight Lines perpendicular to ad , respectively equal to the Ordinates $1\ 2\ 3\ 4$, and then tracing the Curve thro' their Extremes, it will be the Curve for the Diagonal Rib, as required

By the same Rule, the Ribs for all other Kinds of regular or irregular Groins are found, be their Plans what they will, and their

their Arches femi-circular, femi-elliptical, or Scheme ; as is evident by Figures B C D E and F ; which a little Inspection will make evident to the meanest Capacity

CHAP. VIII. *Of Trussed Partitions, Trussed Girders, Naked Flooring, &c.*

IN Plate LXXXIII, are three Varieties of Trussed Partitions, of 40, 50, and 60 Feet Bearing, for Graineries, Warehouses, &c. wherein great Weights are laid ; of which the middle one is for two Stories Height.

II. IN Plate LXXXIV, the Figures A B C represent three Varieties of trussed Girders ; which ought not to exceed 25 or 30 Feet in Length ; and Figure D is a Girder cut Camber, which, for Lengths from 15 to 20 Feet, will do without being trussed, as the preceding.

The Scantlings of Gardens should be

Lengths from $\left\{ \begin{array}{c} 12 \\ 15 \\ 18 \\ 21 \\ 24 \\ 27 \end{array} \right\}$ to $\left\{ \begin{array}{c} 15 \\ 18 \\ 21 \\ 24 \\ 27 \\ 30 \end{array} \right\}$ to be $\left\{ \begin{array}{c} 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \end{array} \right\}$ by $\left\{ \begin{array}{c} 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \end{array} \right\}$

Note, THAT Girders should have at least 9 Inches Bearing in the Walls, and be bedded on Lintels, laid in Loam, with Arches turned over their Ends, that they may be renewed at any Time without Damage to the Pier.

III In the upper Part of this Plate, I have shewn three Bays of Joists, or naked Flooring, wherein the two outer ones have only their binding Joists expressed; and that in the Middle with their Bridging Joists, (or Furring Joists) as called by some. In this Kind of Flooring 'tis to be noted, that binding Joists are so framed as that

their under Surface be level with the under Surface of the Girder, and the upper Surface of their Bridgings with the upper Surface of the Girder.

THE Distance of binding Joists should not exceed 3 Feet and a half, or 4 Feet, in the Clear, and their Scantlings should be as follows, *viz.*

	Feet.		Inches	
If their	$\left\{ \begin{array}{c} 8 \\ 10 \\ 12 \end{array} \right\}$	their Scantling	$\left\{ \begin{array}{c} 6 \\ 7 \\ 8 \end{array} \right\}$	by $\left\{ \begin{array}{c} 5 \\ 5 \\ 5 \end{array} \right\}$ Inches.
Length be				

BRIDGING Joists should be laid at 1 Foot in the Clear, and their Scantlings should be 3 by 4, 3 and a half by 4, or 4 by 4, &c.

IN common Flooring, where neither Binding nor Bridging Joists are used, the Scantlings of Joists ought to be as follows, *viz.*

	Feet	
If the Length be	$\left\{ \begin{array}{c} 10 \\ 11 \\ 12 \end{array} \right\}$	their Scantling to be $\left\{ \begin{array}{c} 7 \\ 8 \\ 9 \end{array} \right\}$ by $\left\{ \begin{array}{c} 3 \\ 3 \\ 3 \end{array} \right\}$

Note, No Joists to exceed 12 Feet in Length, to have at least six Inches Bearing, and that on a Lintel or Bond Timber, and their Distance in the Clear not to exceed one Foot. 'Tis also to be observed, that all Joists on the Breasts and Backs of Chimneys be framed into Trimming Joists (whose Scantlings are to be the same as those of Binding Joists) at 6 or 8 Inches Distance behind, and 12, 16, &c. Inches before, as *a a*

CHAP. IX. Of Raofs

THE Requisites to Roofing, is the Scarfing and Completing of Raifings, or Wall-Plates, &c. to determine the necessary Height of the Pitch, agreeable to the Covering; to find the Lengths of Principal and Hip-Rafts, and to back them when necessary;

to contrive the proper Trusses for to strengthen the principal Rafters, and to lay out in Ledge ment the several Skirts, thereby to determine the Quantity of Materials necessary; and to find the several Angles and Lengths of all Parts; so as to set out Work, and fix, at once, the Whole in a Workman-like Manner, and in the least Time

Now, in order to make the young Student a Master herein, I have shewn,

I. IN Plate LXXXV, by Figures C D E F G H I K L M ten different Manners of Scarfing together the Raisings of Roofs, which is the first Work to be done, and then the Beams being cogg'd down thereon at their proper Distances, which should never exceed 10 Feet in the Clear, we may begin to consider, and work the Superstructure to be raised thereon

THE first Thing to be considered is the Height of the Pitch; which must be determined according to the Covering; which, if with plain Tile or Slate, the true Pitch, as Fig A, will be proper. But if with Pan-tiles or Lead, it may be much lower. But here, for Example's Sake, we will suppose a Roof to be true Pitch, whose Plan is *r v t b*, Fig. B, and whose Breadth we will suppose is equal to *g 4*, Fig A

To find the Length of a principal Rafter.

DIVIDE *g 4*, in 4 Parts, on *g* and *4*, with the Radius of 3 Parts, make the Section *b*; then draw the Lines *g b*, and *b 4*; and each is the Length of a principal Rafter required.

To find the Length of the Hip-Rafters.

DRAW the Central Line *o a*, and the Diagonals or Bases, over which the Hip-Rafters are to stand, as *r a*, *t a*, *a v*, and *a b*, make *a t*, *a b*, and *a r*, in Fig. A, equal to *a t*, *a b*, and *a r*, in Fig B, and draw the Lines *b t*, *b b*, and *b r*; then *b r* is the Length of the Hip-Rafter *r p*, *b b* is the Length of the Hip *g b*, and *q v* and *b t* is the Length of the Hip *t s*

OR otherwise, on the End of the Diagonal *r a*, raise the Perpendicular *a q* equal in Height to *b a* in Fig A, and draw the Line *r p*,

which is the Length of that Hip, and equal to br , in Fig. A, as before. By the same Rule you may find the Lengths of all the other three Hips

To find the Angle of the Back of any Hip-Rafter

THROUGH any Point of its Eave, as c in Fig. B, draw a right Line at right Angles, as fb , cutting the Out-lines of the Plan in f and b . From the Point c , let fall a Perpendicular, scd , on the Hip gb ; and make ce equal to cd . Draw the Lines fe , and be , and the Angle bef is the Angle of the Back required.

To lay out a Roof in Ledge ment Plate LXXXVI

LET b_1dc be a given Plan, ab , Fig. B, the given Pitch; and bg , be , a Pair of principal Rafters agreeable thereto

By the preceding, draw the Ridge-Line aa , and the Diagonals ad , ac , and ab , a_1 . In Fig. B, make ac , ad , and ab , equal to the Diagonals ad , ac , and ab , a_1 , in Fig. A. Thro' the Points aa , in Fig. A, draw the two Beams gh , and ea . Make rg , se , and tl , $4m$, each equal to the Length of a principal Rafter, as bg , Fig. B; and draw the Lines ds , sr , rb , and il , lm , mc . On the Points B and 2, in Fig. A, with the Radius bb (the Length of the Hip) make the Section t , and draw the Lines bt and ti .

On the Point d , in Fig. B, with the Length bd in Fig. B, and on c with the Length bc , make the Section o , then drawing the Lines do and co , the Skirts of the whole Roof are laid, which fill up with small and Jack Rafters at Pleasure

Now, when the Skirts of a Roof are thus drawn on Paper, and are cut out round at their Extremes, and be truly bended or turned up on the Out-lines of the Raising, as b_1 , bd , ac , and a_1 , they will all come truly together, and become a Model of the Roof required, wherein every Rafter may be expressed in its Place, and the just Lengths and Quantity known to a very great Exactness

By the same Rule, the irregular Roof, Plate LXXXVII, is laid out in Ledge ment, and its Requisites found, as is evident at the first View.

Note, As this Plan hath not parallel Sides, every Pair of Rasters will therefore be of different Lengths, although the Height of their Pitch is the same, and so consequently every Raster must be backed by taking away a Triangle, as *a e b*, Fig. D, and then the Sole of the Foot of a Raster will be as *c a d b*

THE following Plates consisting wholly of Trusses for Roofs and Domes, need no Explanation more than their own Figures express, to which I refer.

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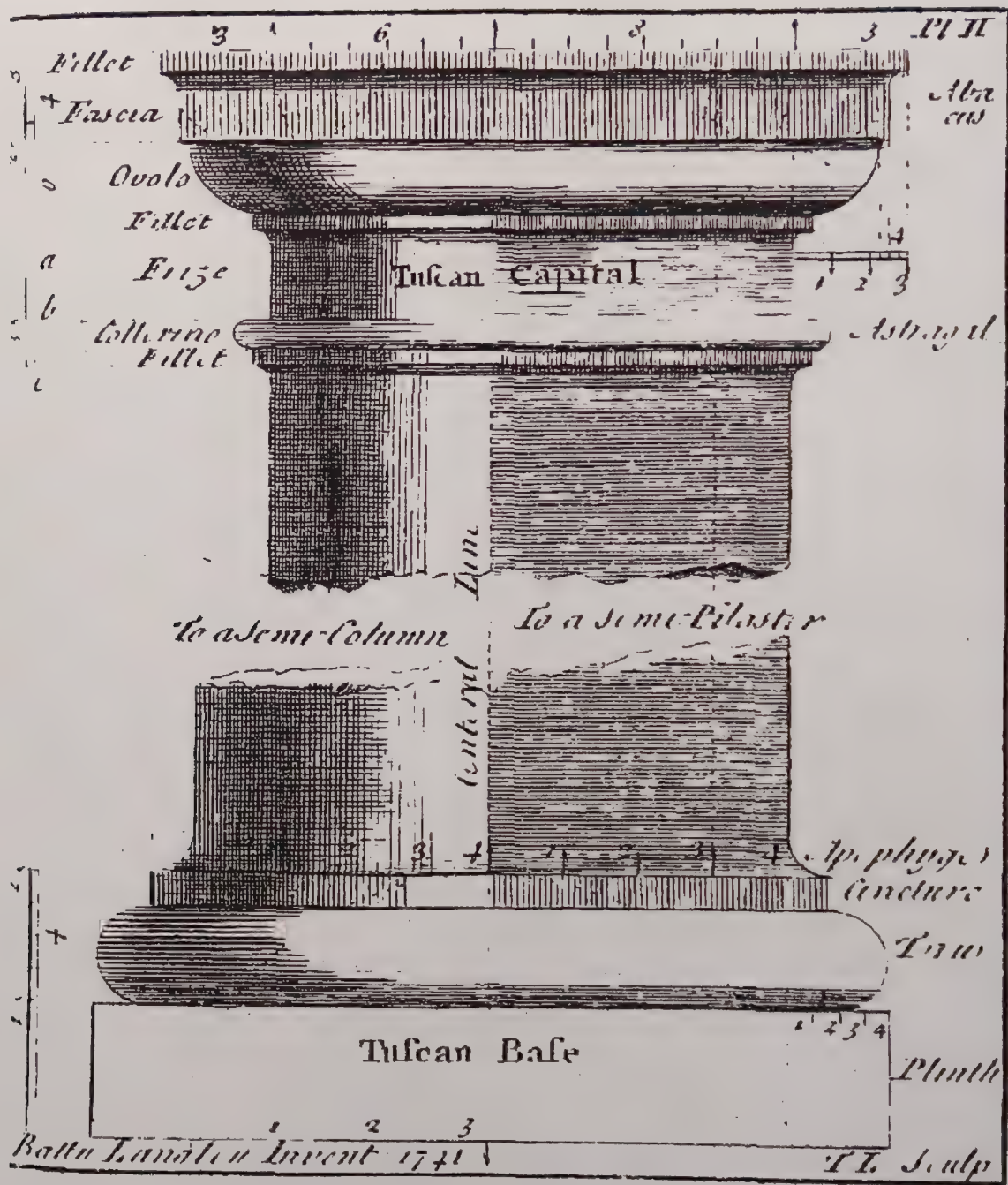
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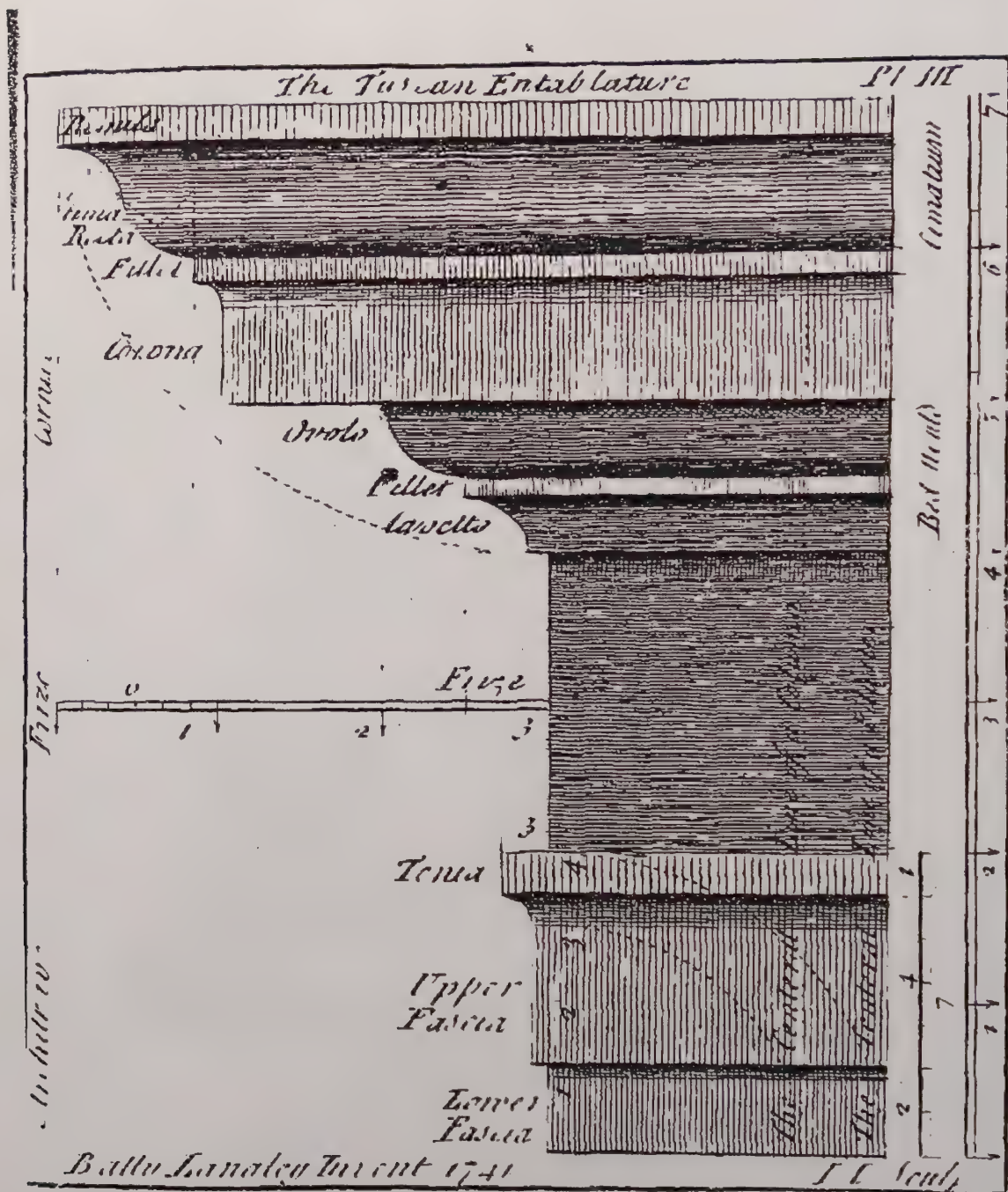
The Doric no 14 several Parts of a Julian Order with a Pedestal & its Parts at Verse

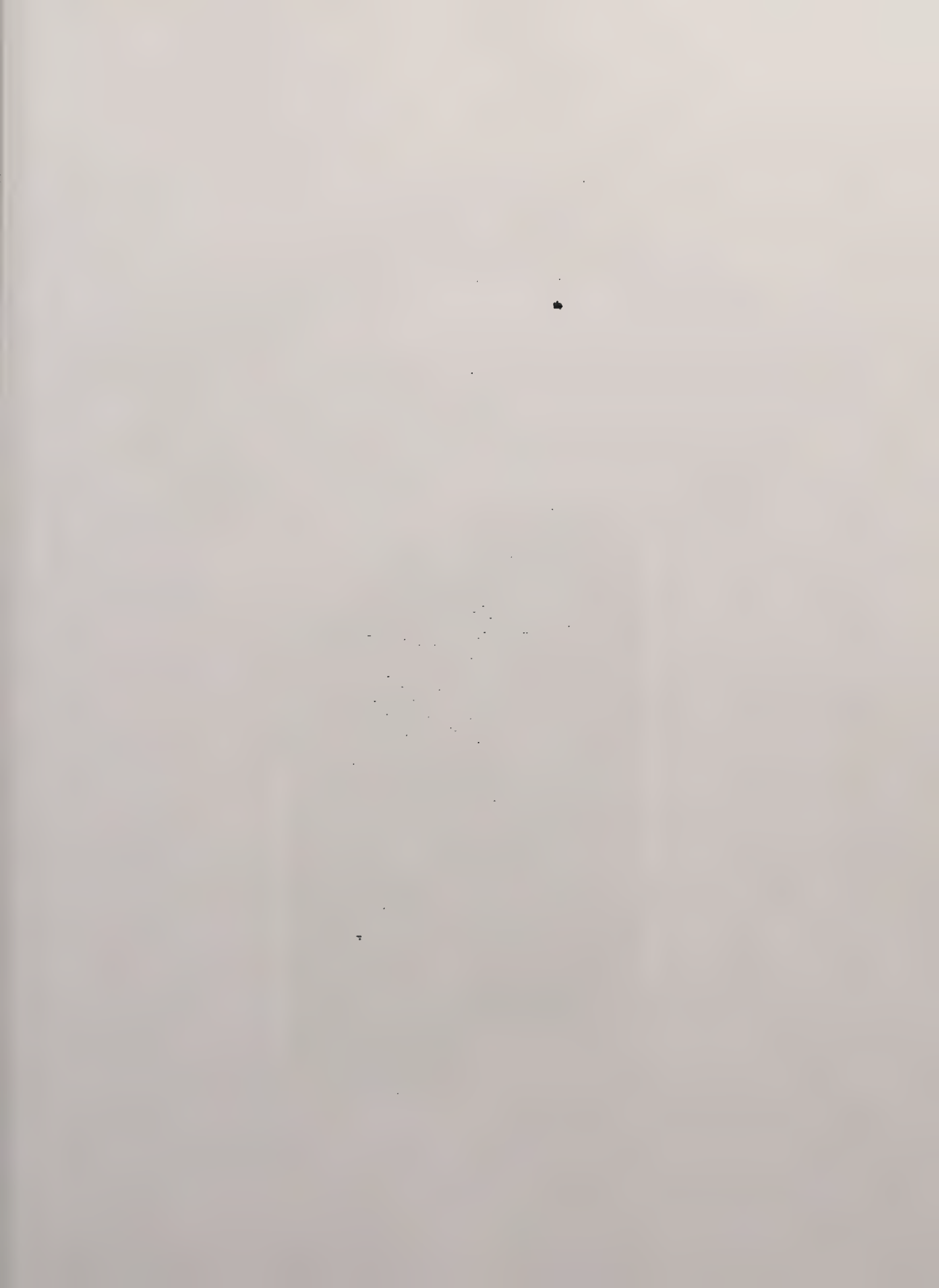


Bolton Langley Invent 1741

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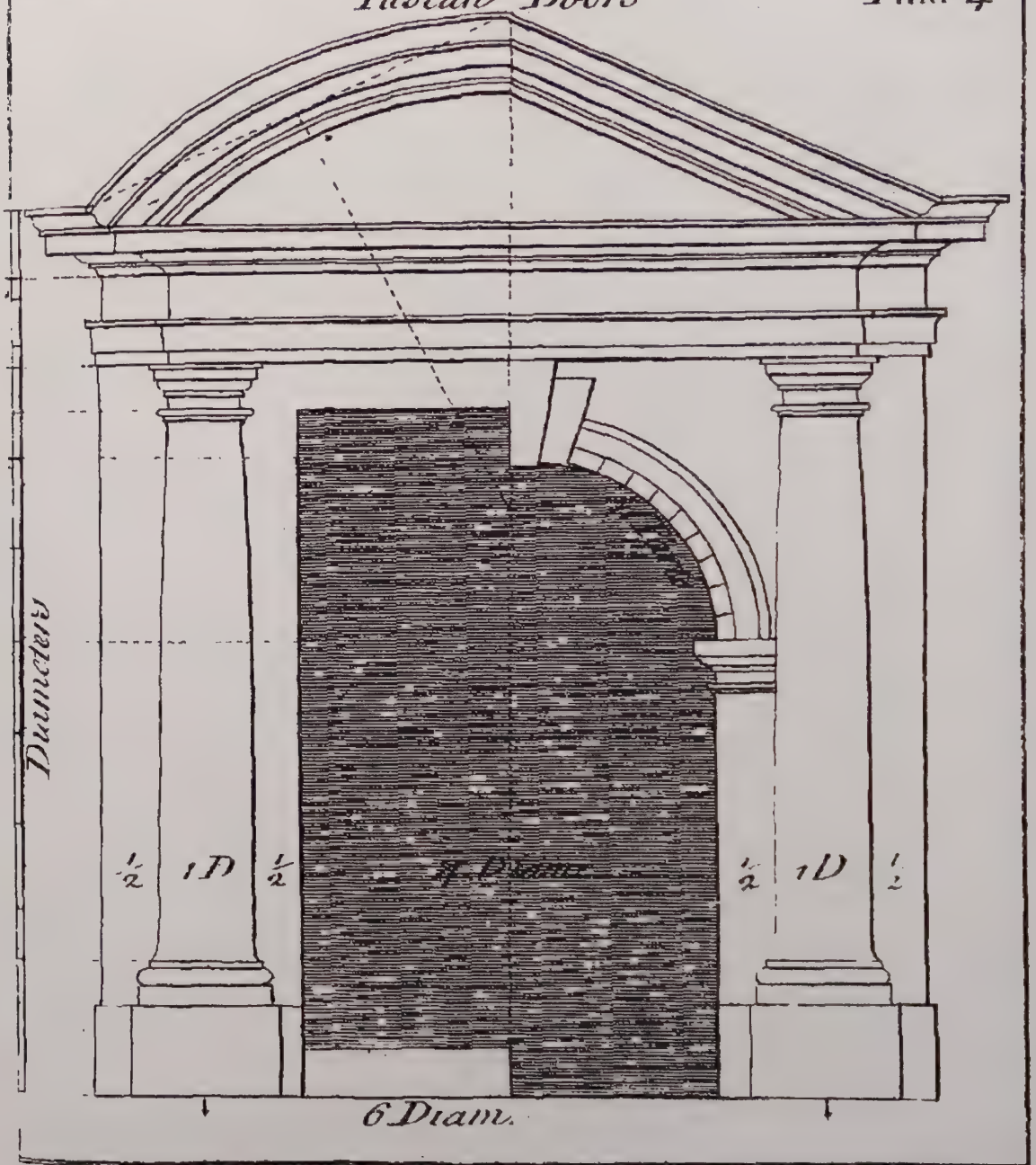


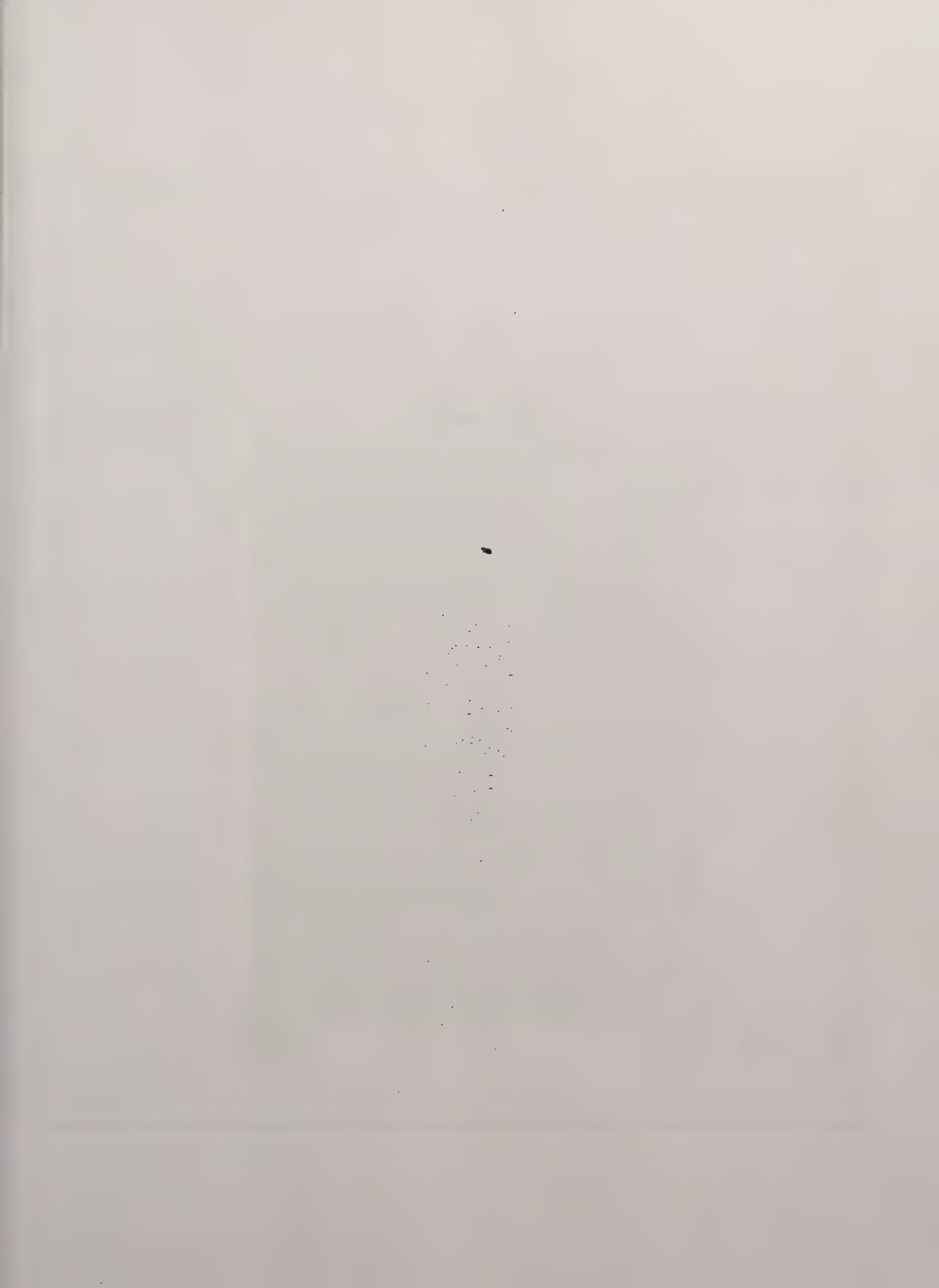




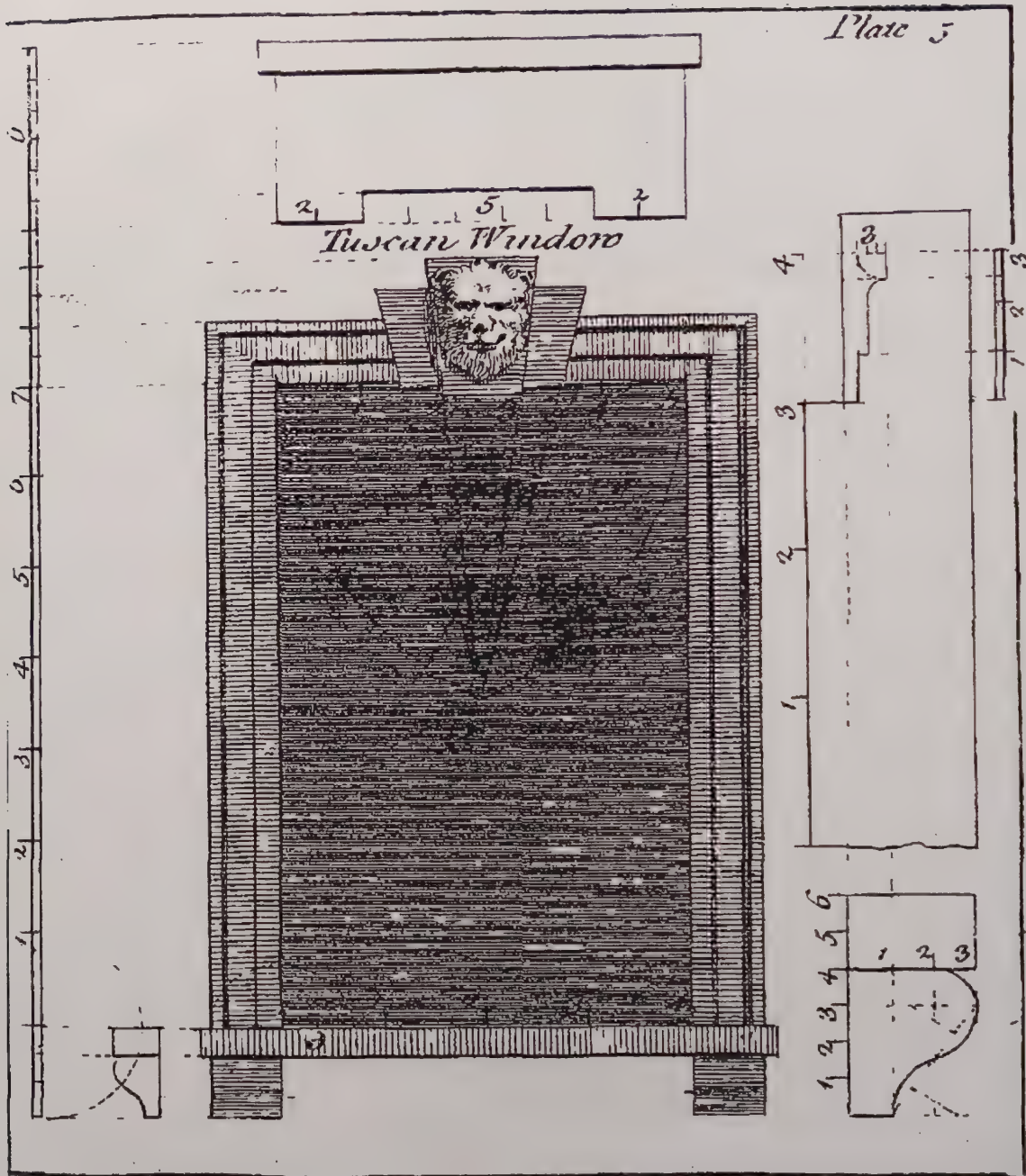
Tuscan Doors

Plate 4

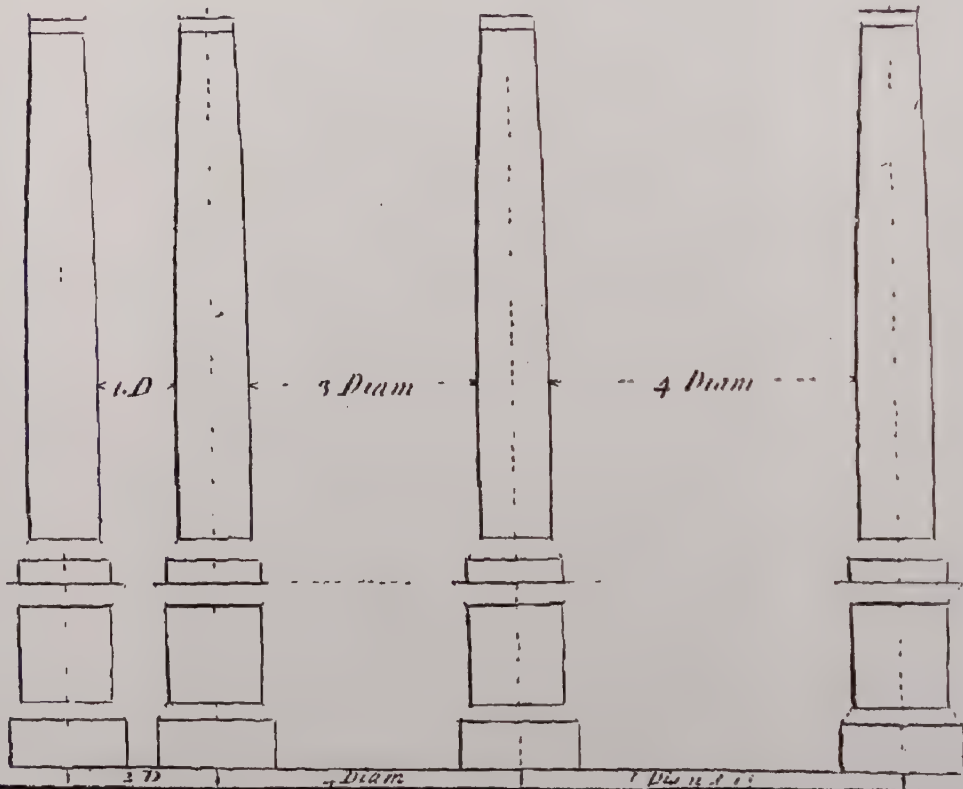




Tuscan Windoro



Lucan Intercolumnations for Portico's, Colonnades &c



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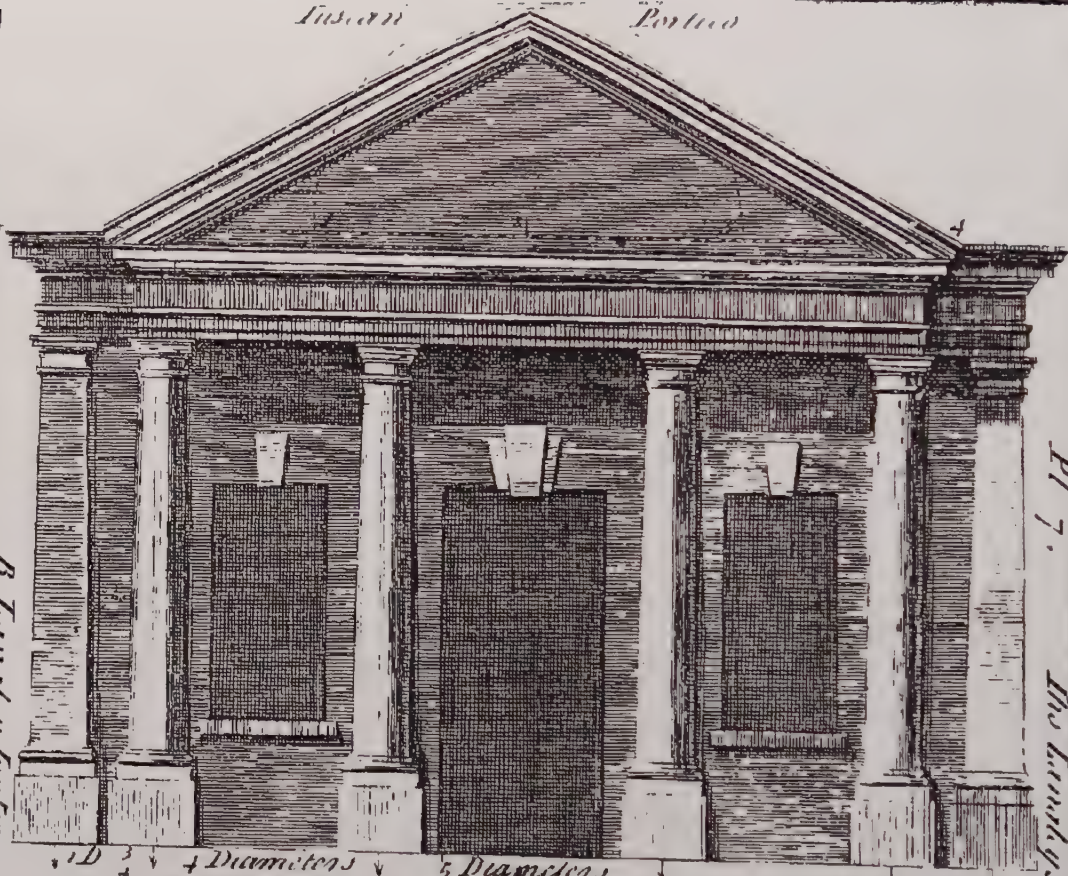
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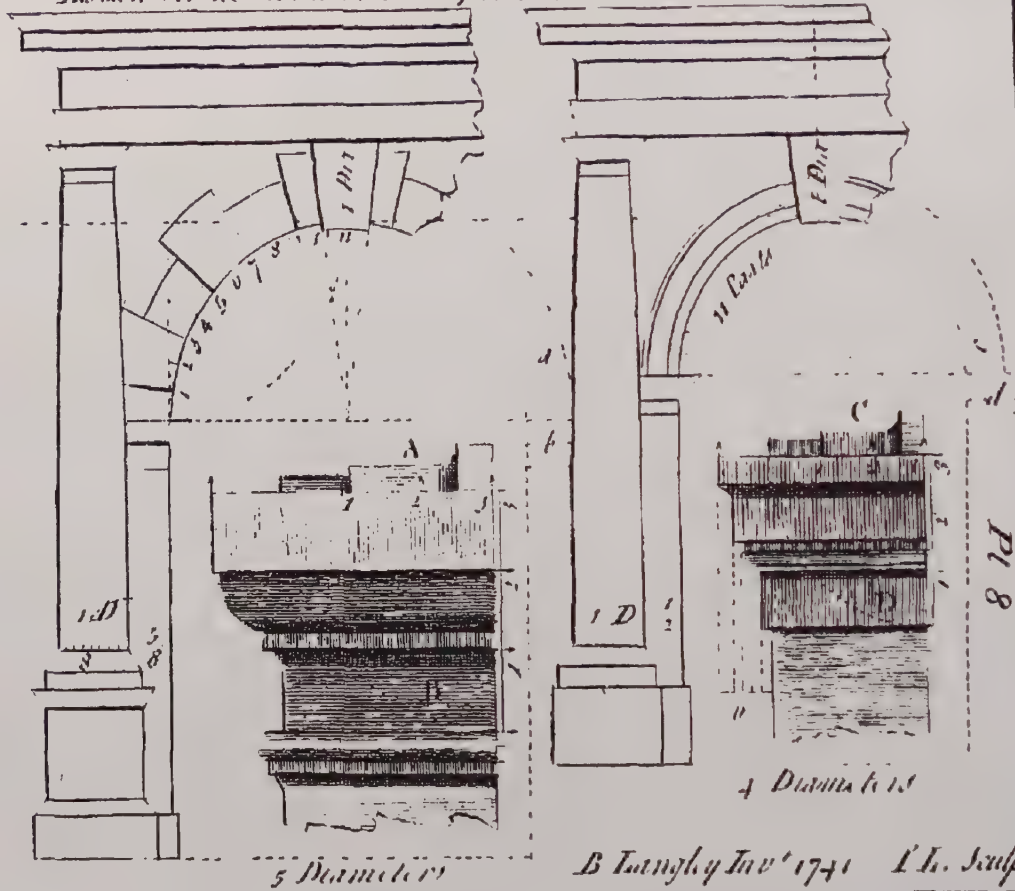
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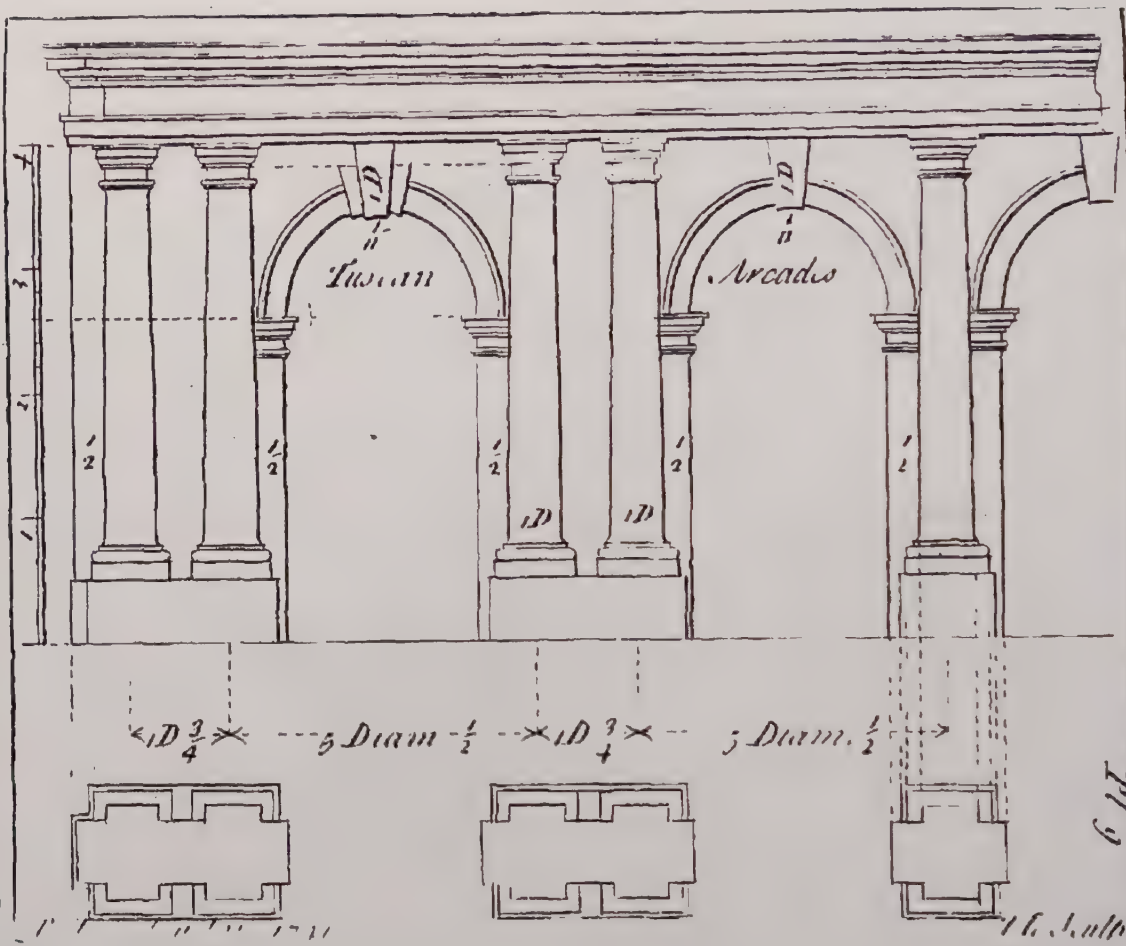
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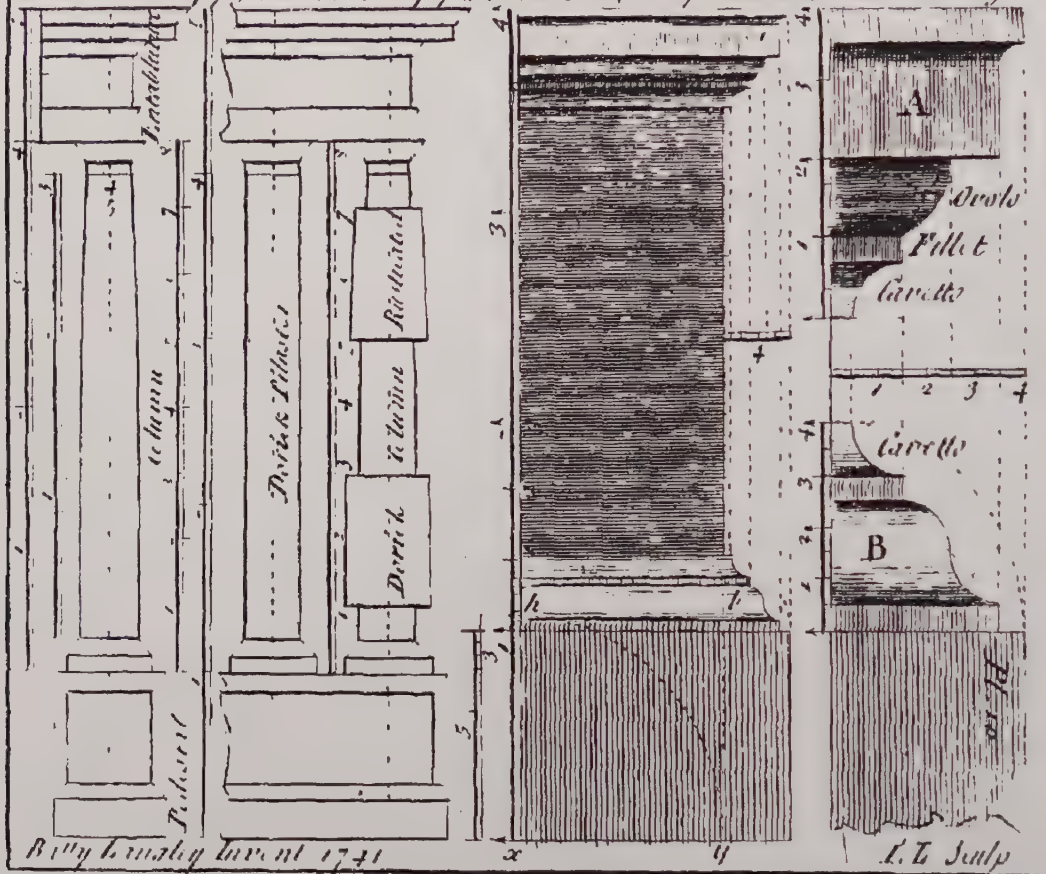


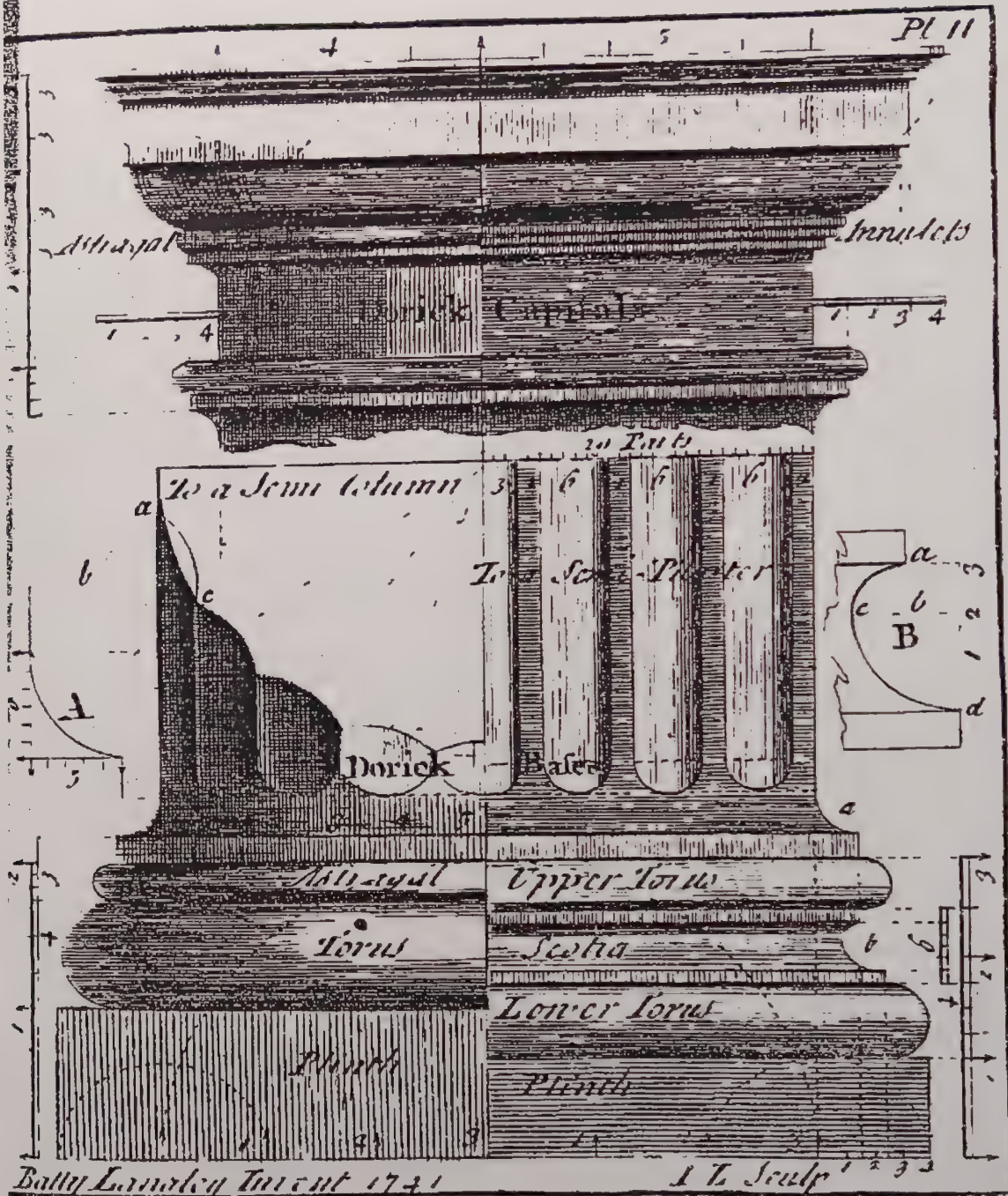
Tuscan Arches with their Imposta and Archivolts



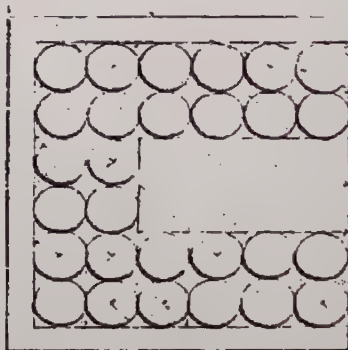


The Divisions of y^e several Parts of y^e Dorick Order, with y^e Substantive Parts at large.



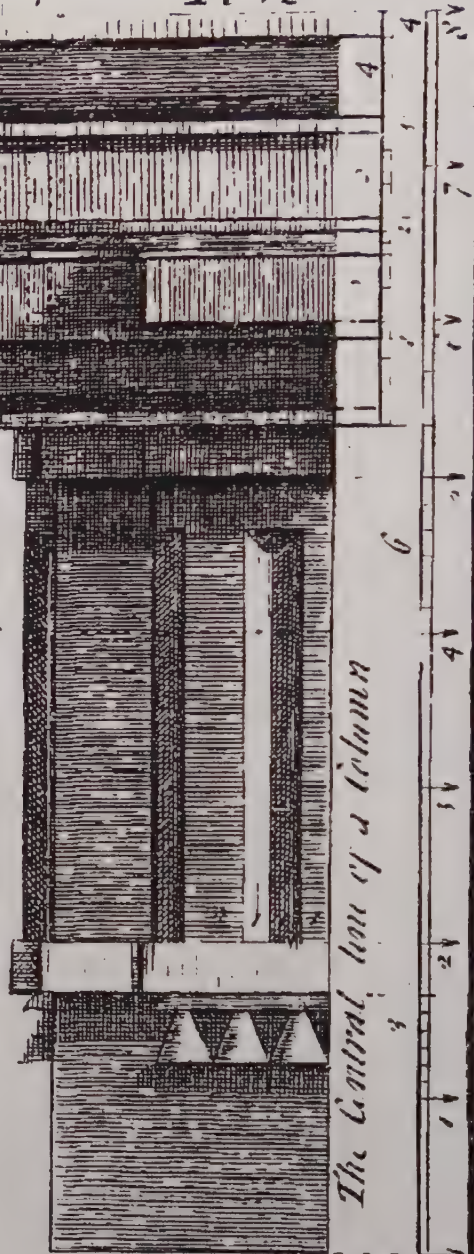


The Doric Entablature

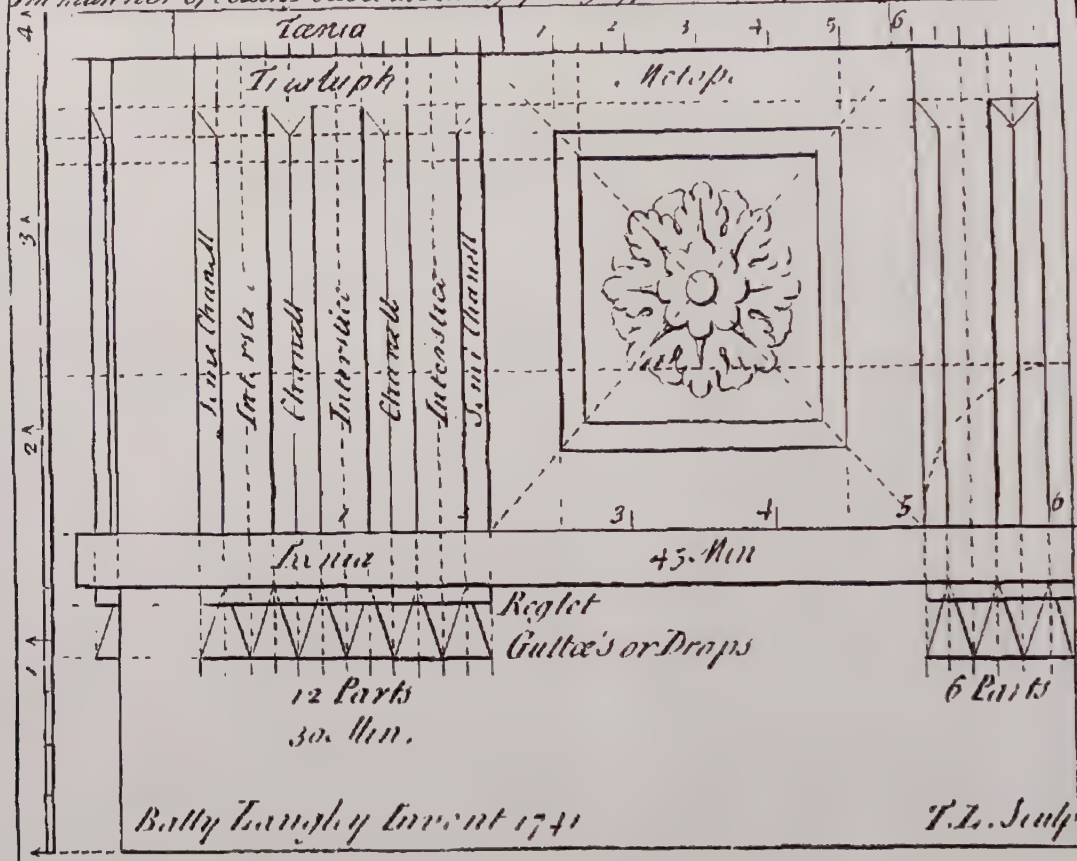


The Plan of a Module

The Central Part of a Column



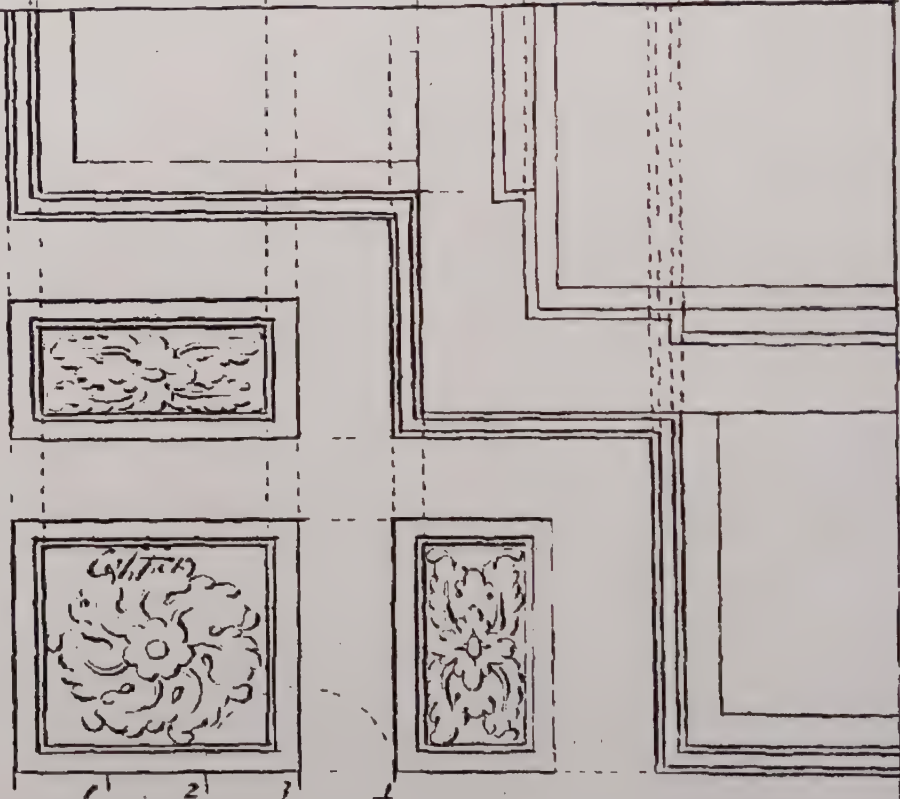
SECTION OF SHEDS AND BUILDINGS BY EGYPTIAN MONARCHES BY DORICK 1750



Mutule

$\frac{1}{2}$ Mutule

The Planities of the Dorick
cornice at an external
Angle Vide Plate XII

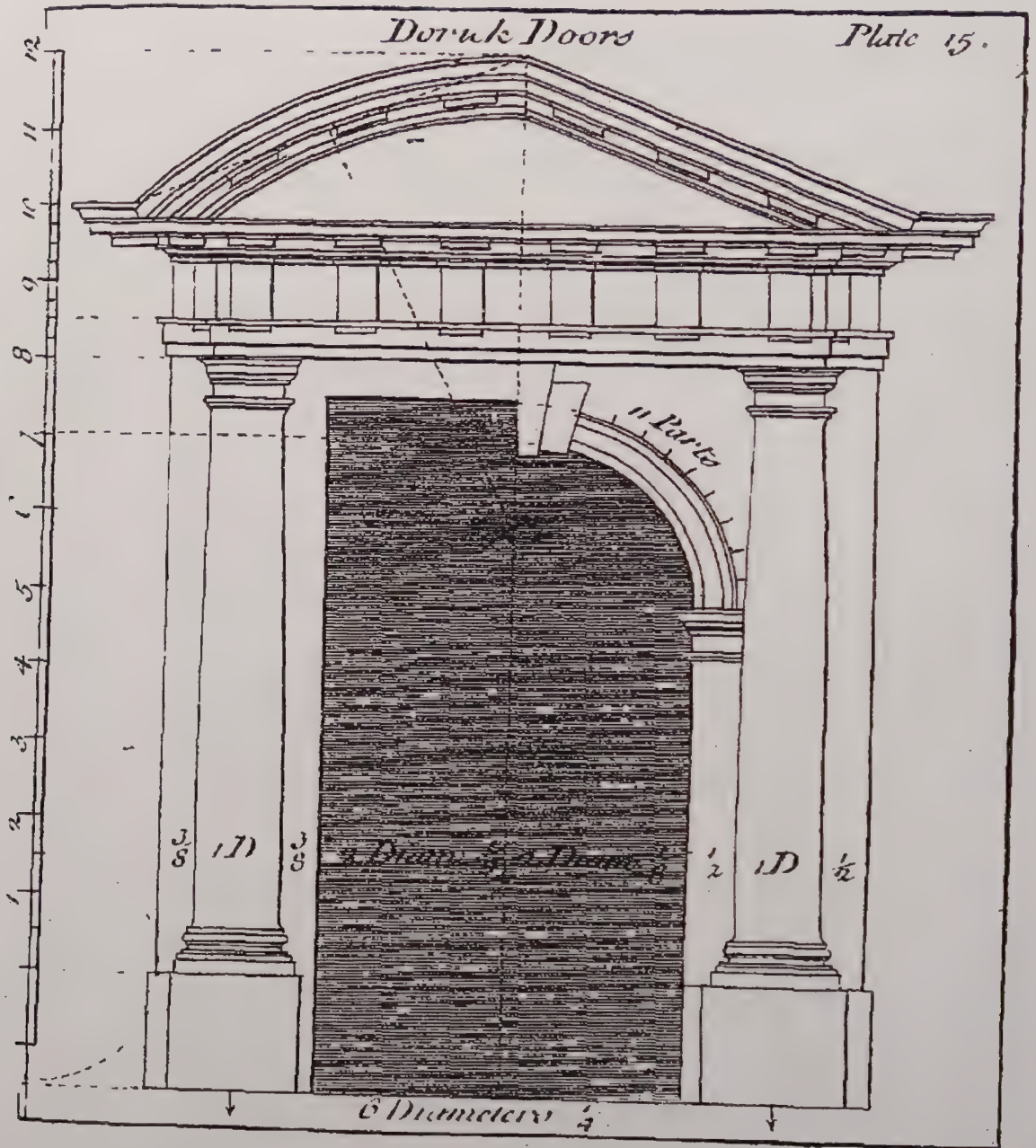


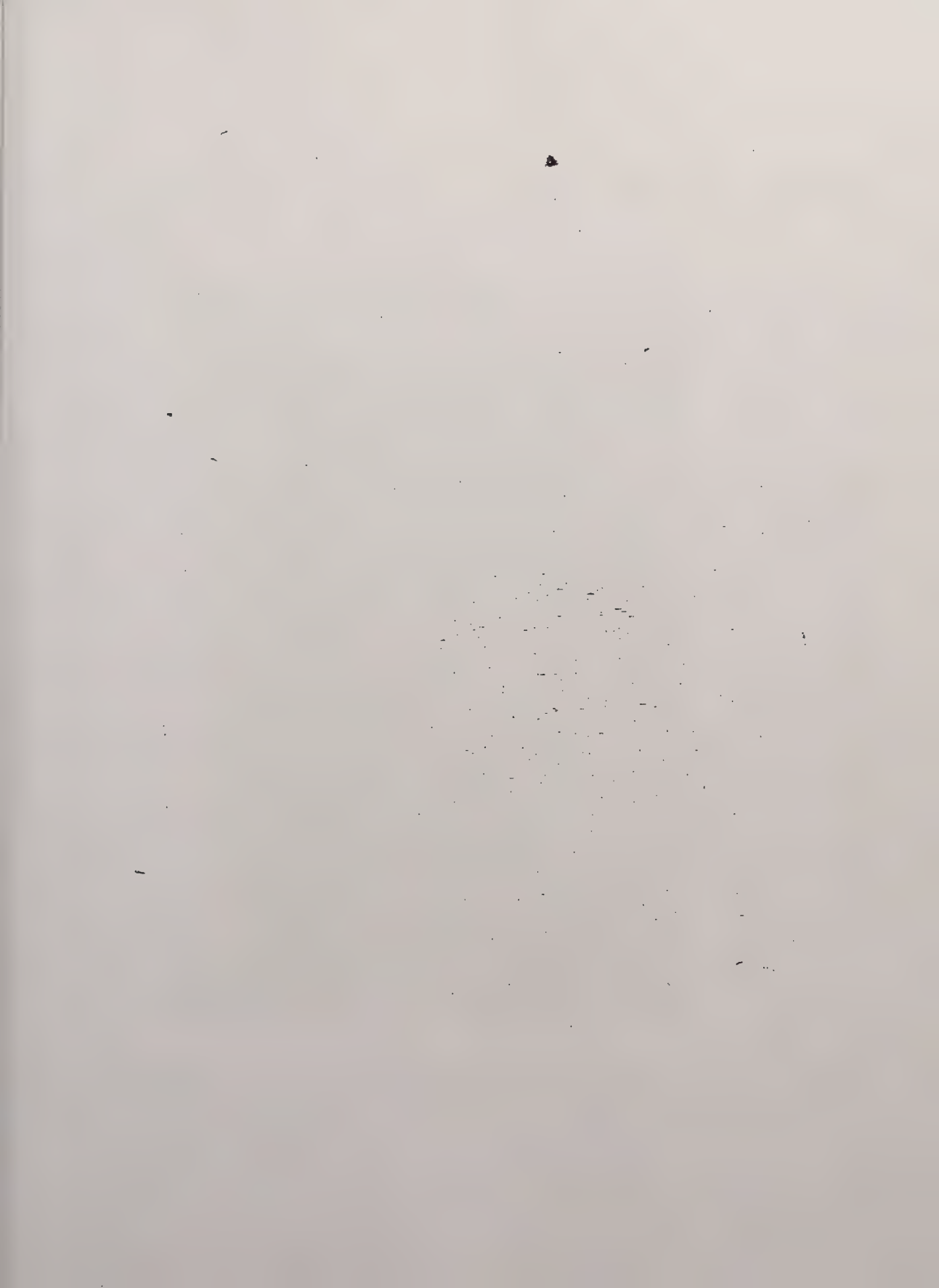
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Doric Doors

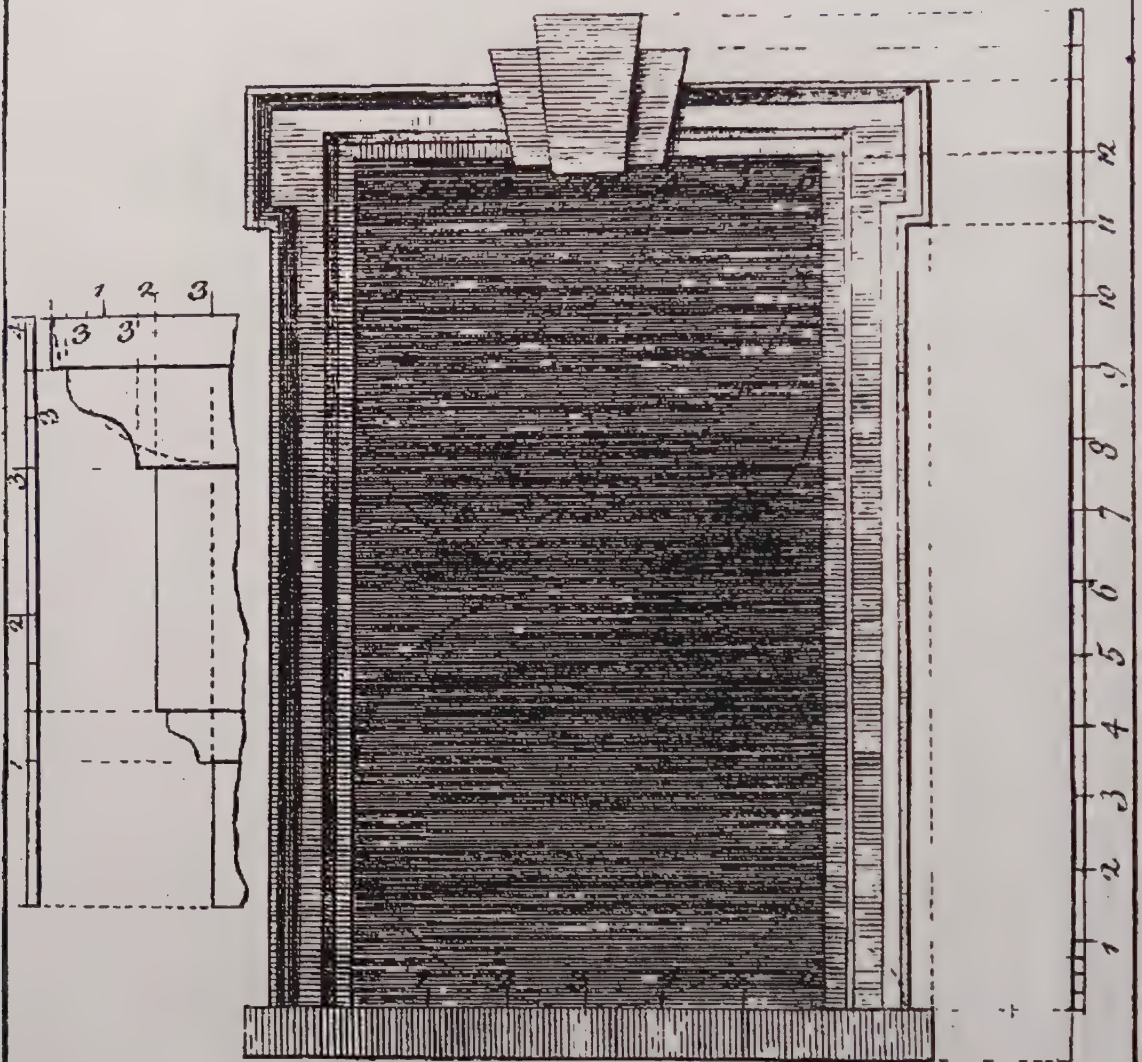
Plate 15.





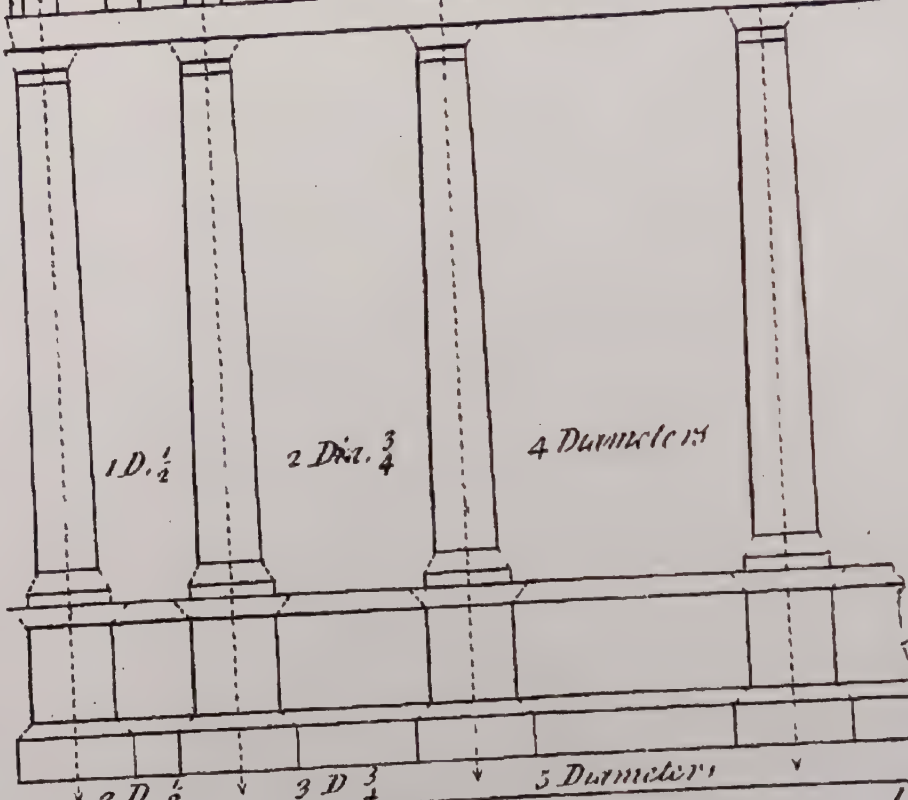
Doric Window

Plate 16



Doric Intercolumniations for Porticos Colonades &c

30	45	30	45	30	45	30	45	30
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Pl. 17.

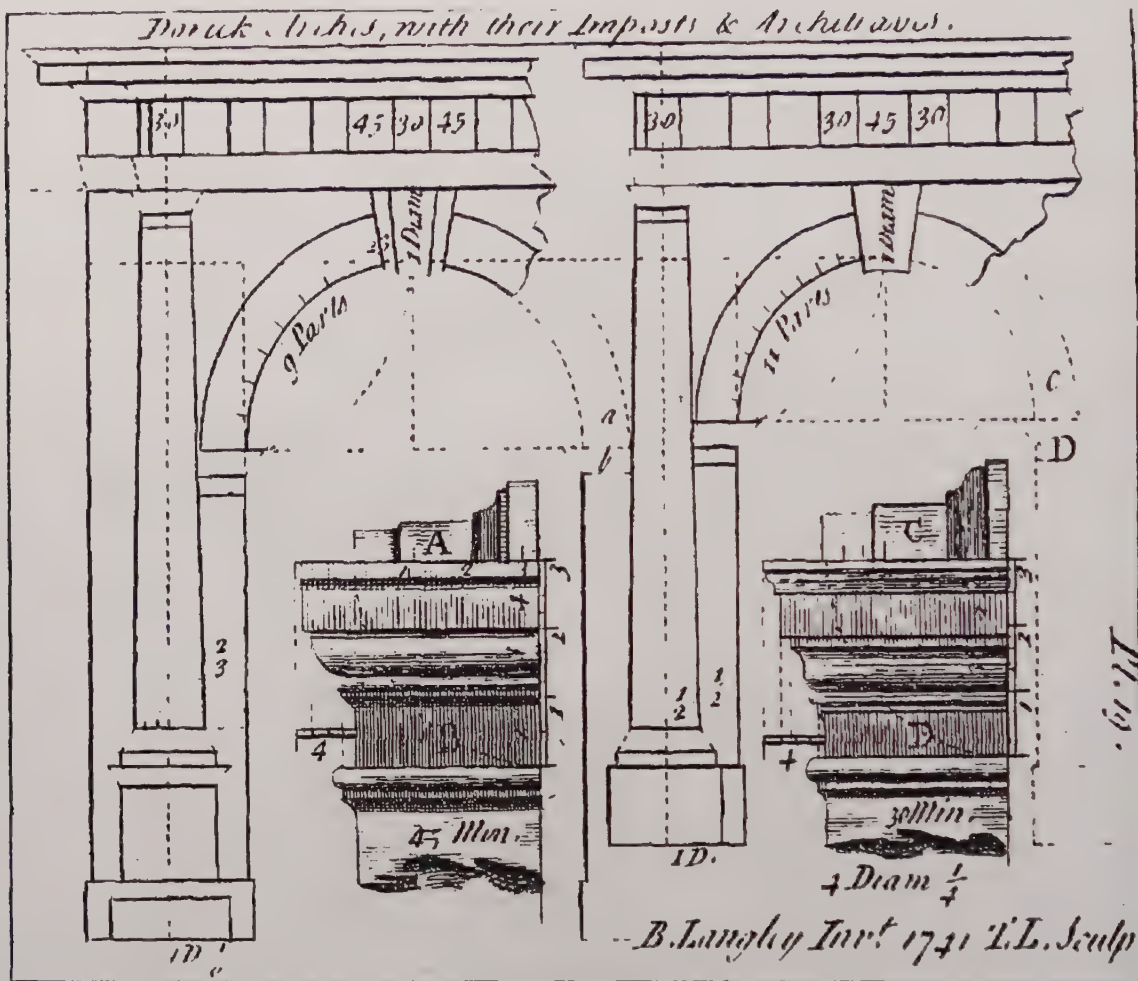
Doric Portico

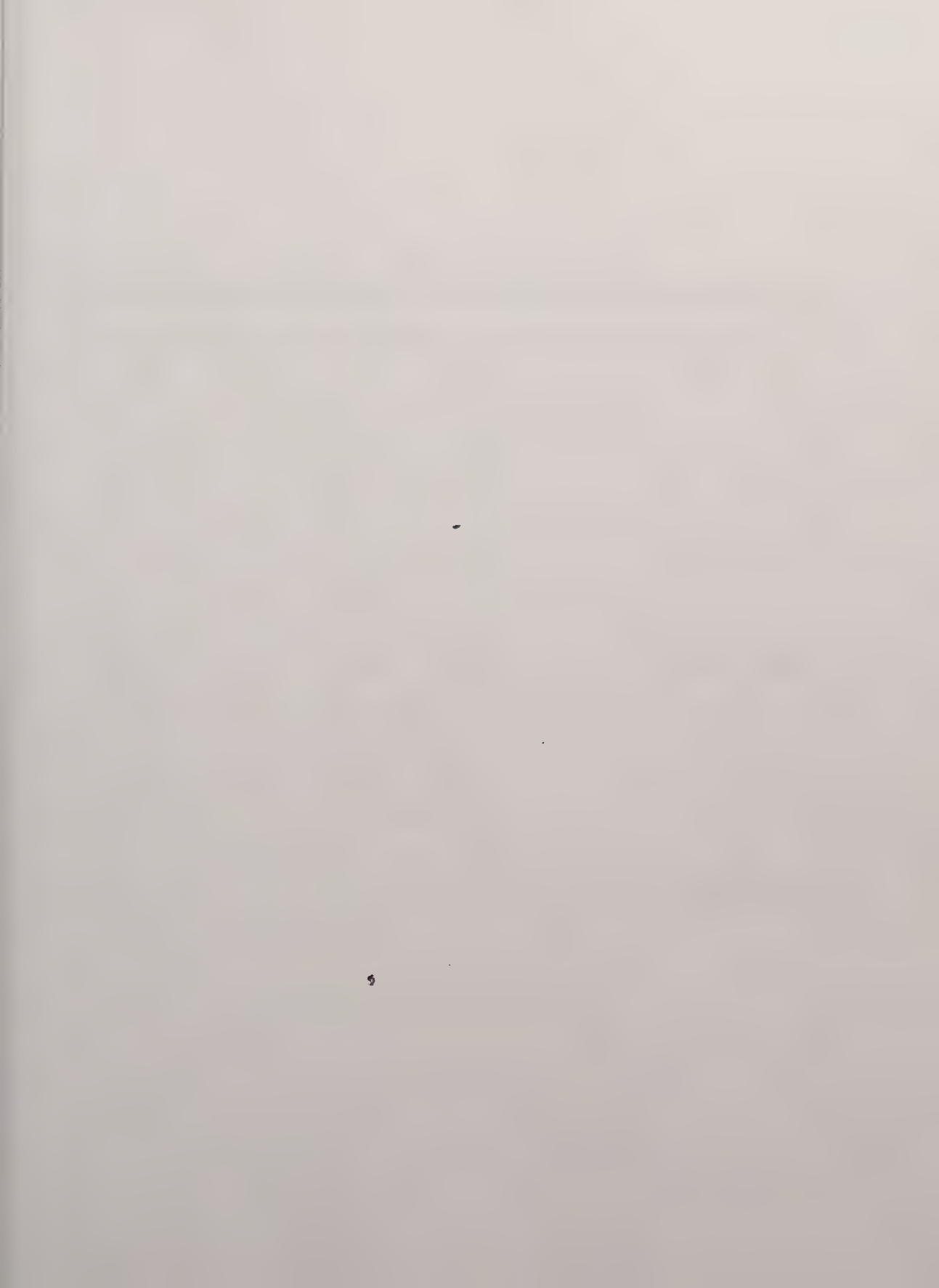


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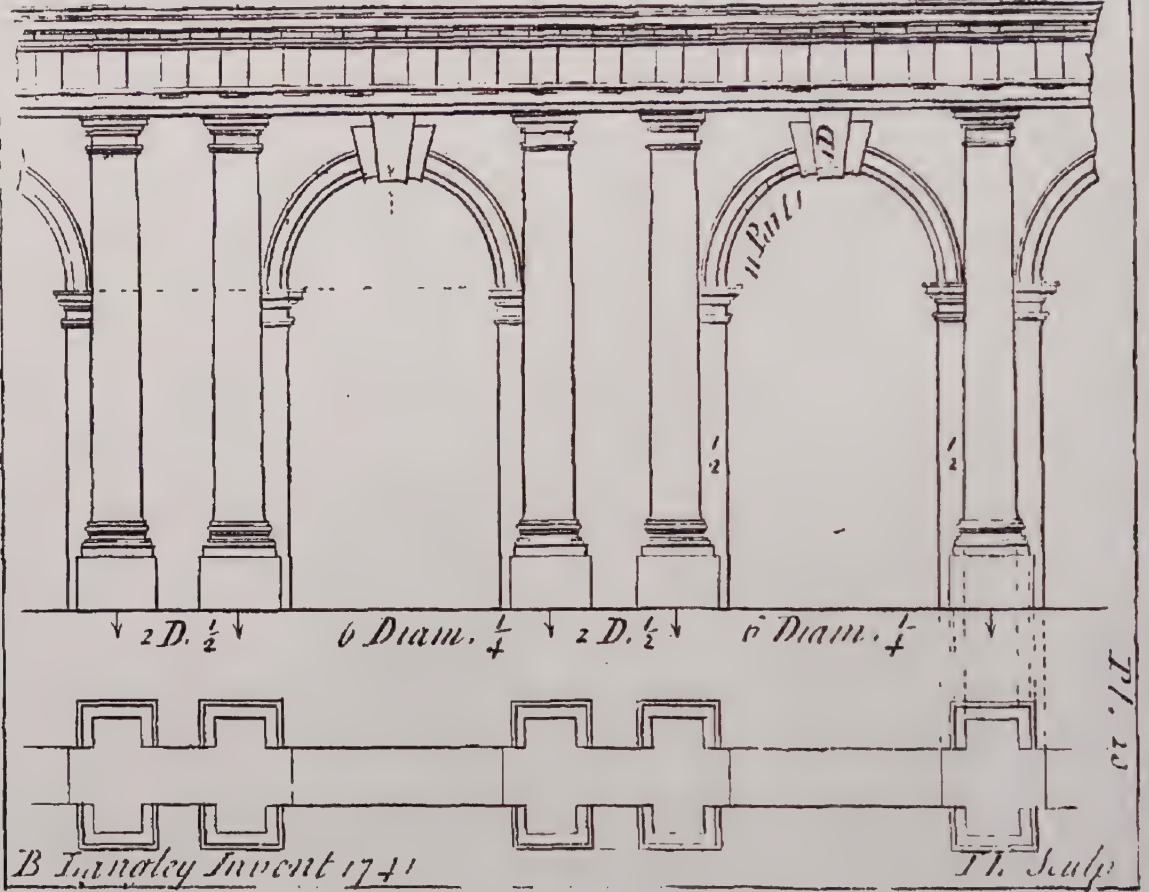
B. Langley Invent 1741. 3 Diameters 3 D $\frac{3}{4}$ 1 D $\frac{1}{2}$ 1 T. Seal

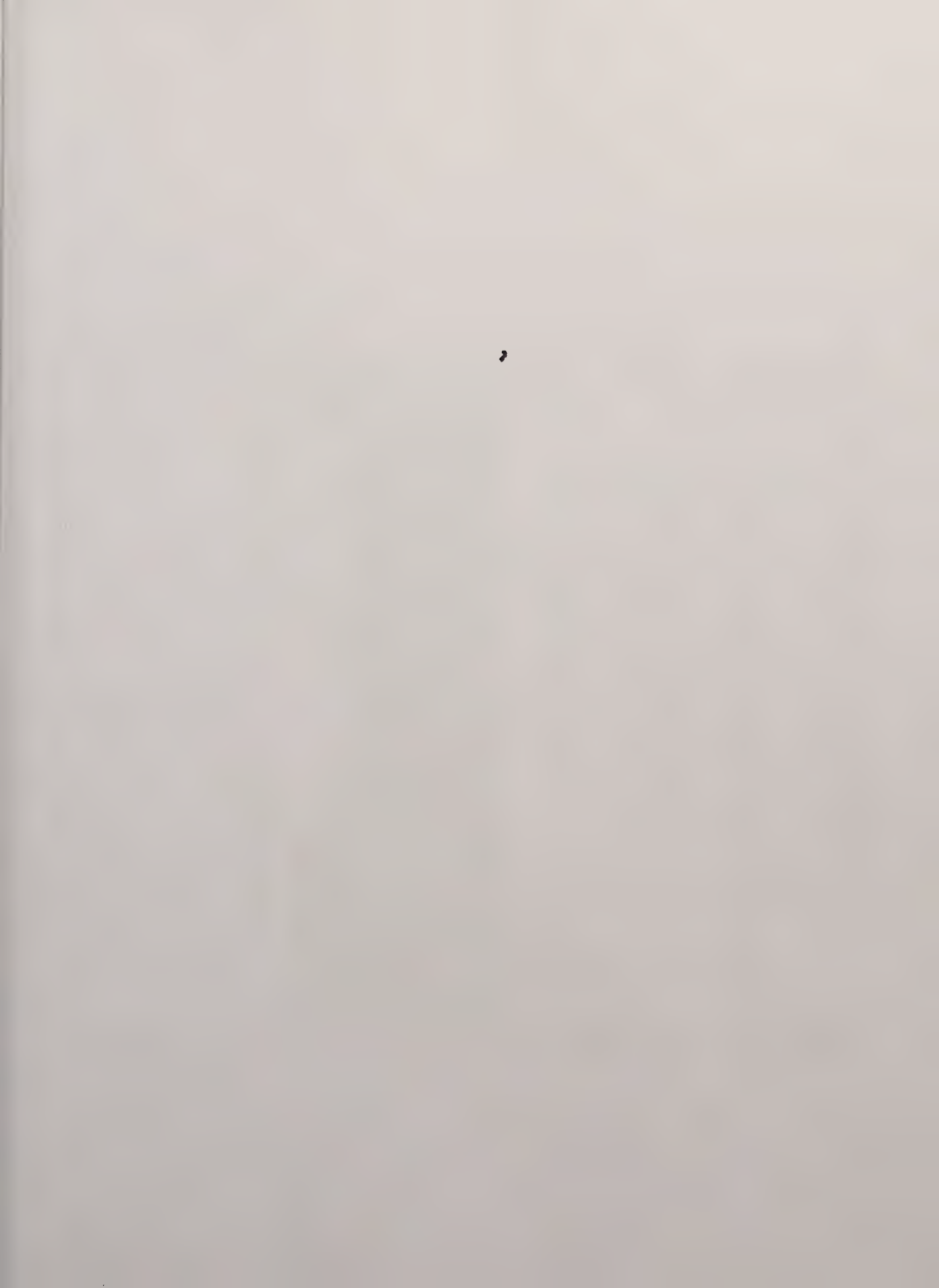
Druck. Niches, with their Imposts & Architraves.



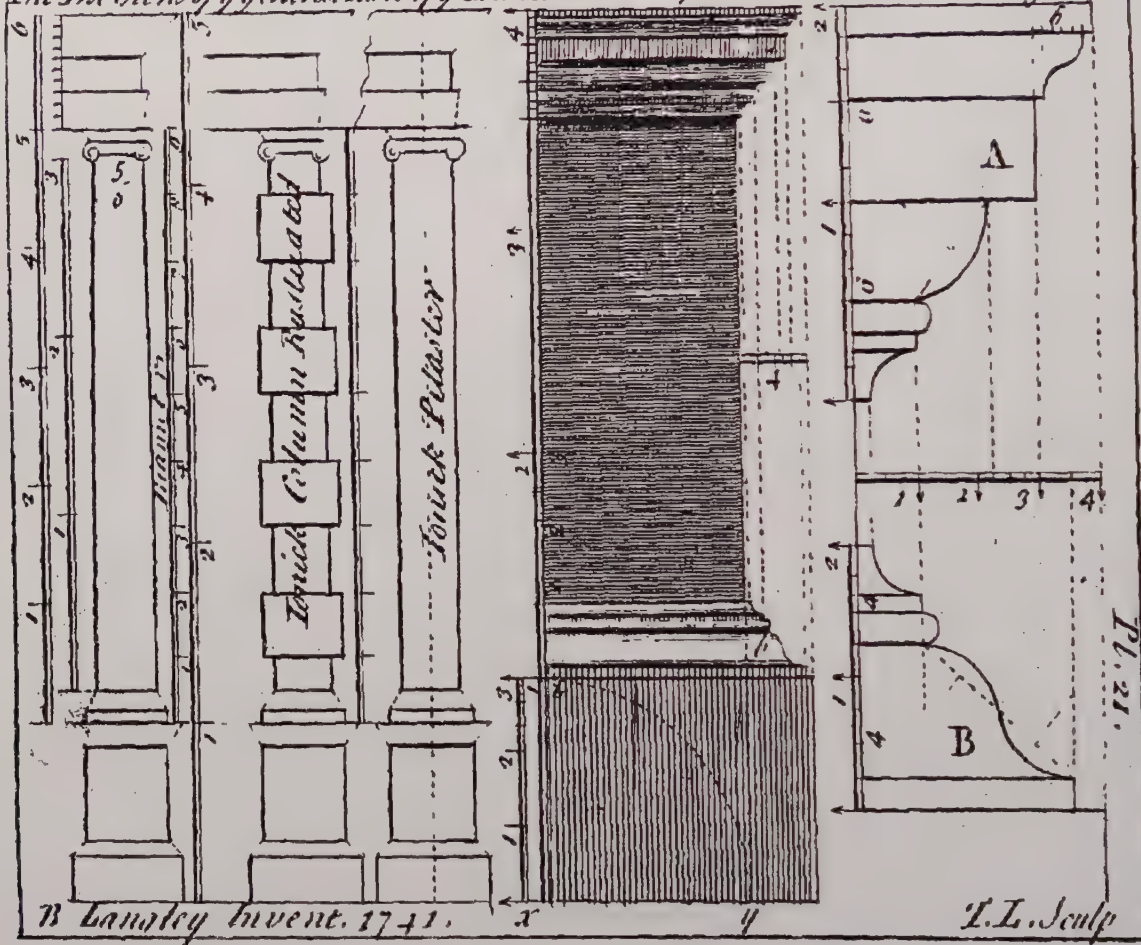


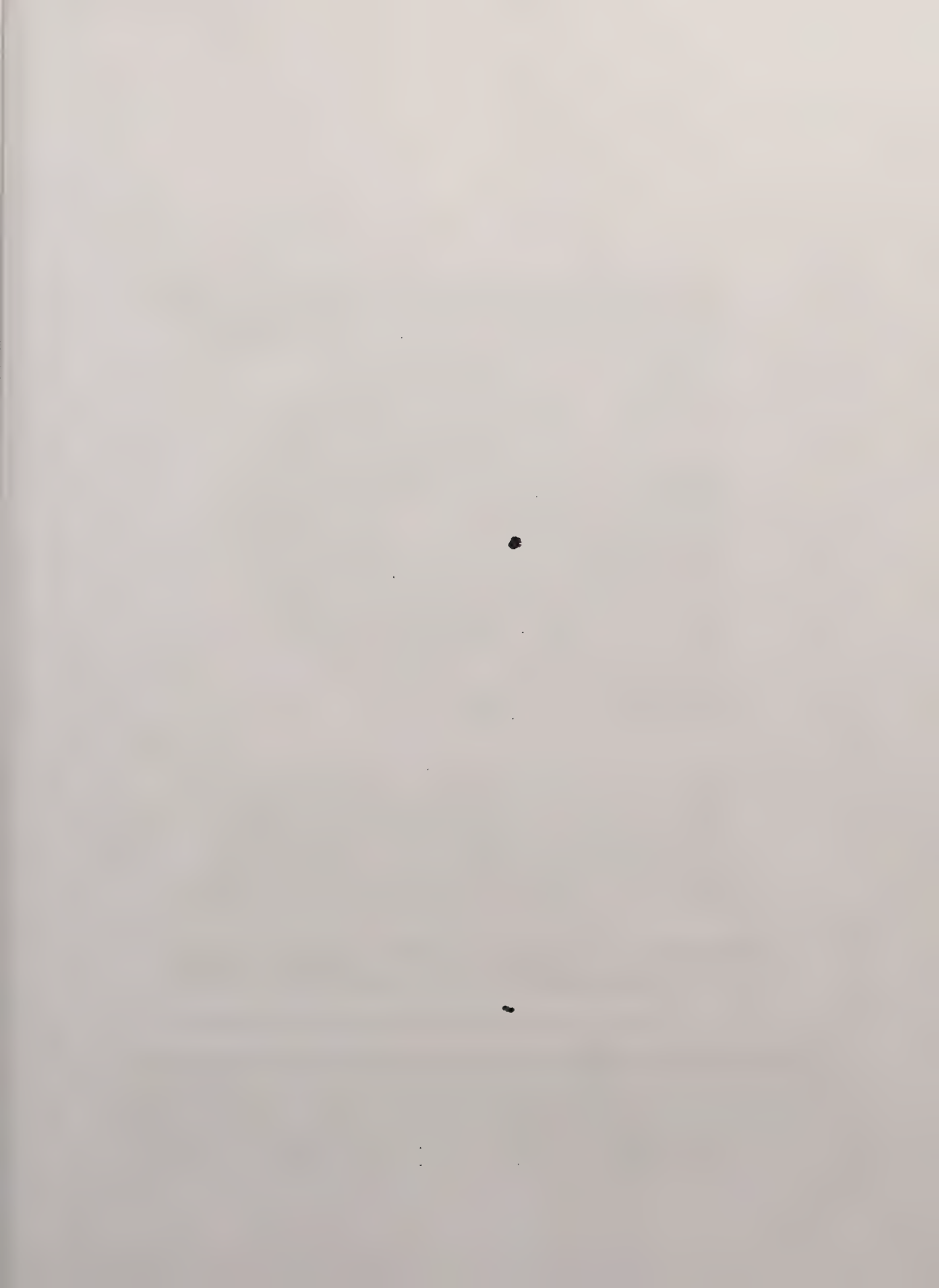
Doric Arcades





The Divisions of the general Parts of the Ionic Order in the Pedestal & its Parts at large.

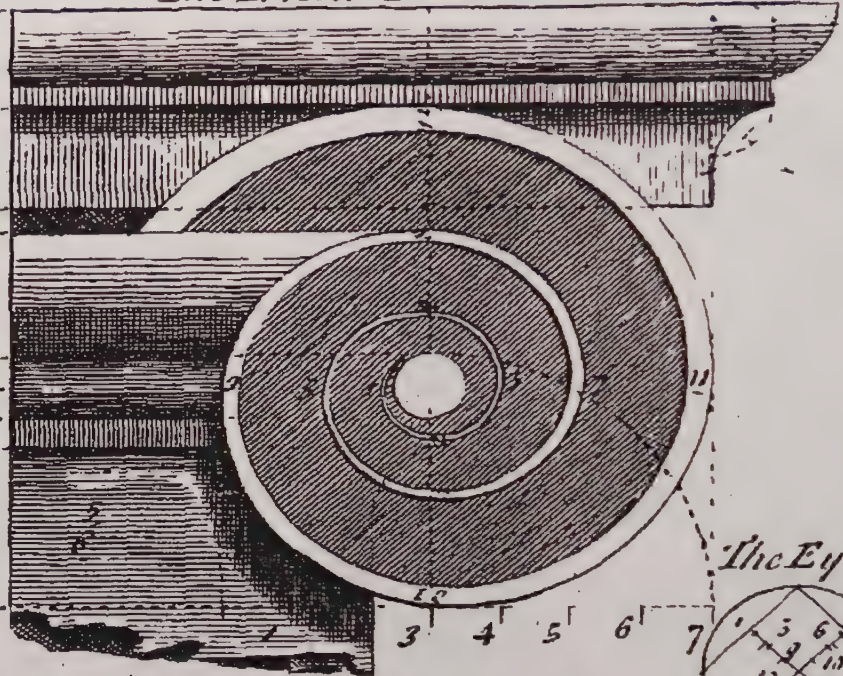




The Ionick Base & Volute

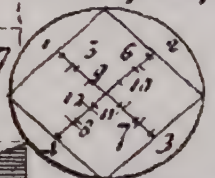
Pl 22

The entire Height, a Semi Diameter

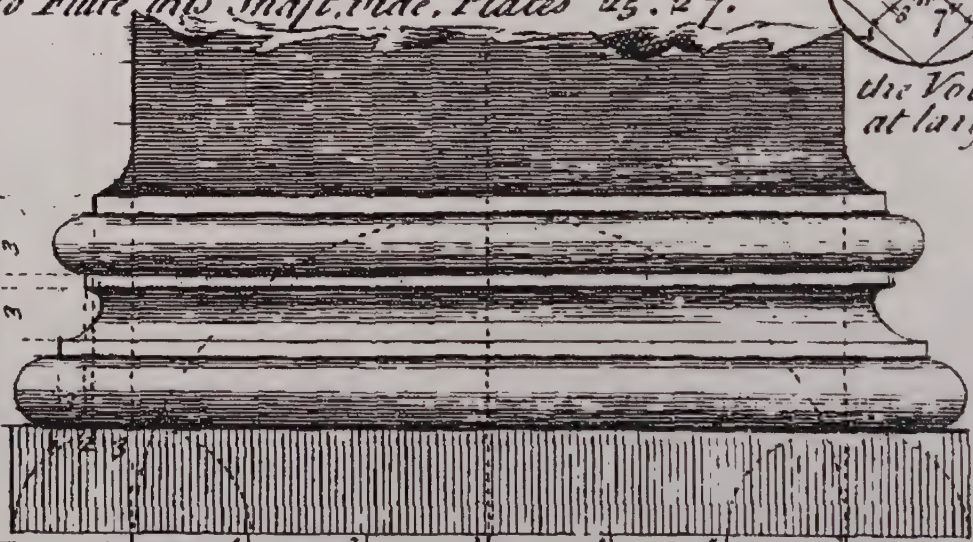


To Flute this Shaft, vide, Plates 25. 27.

The Eye of



the Volute at large

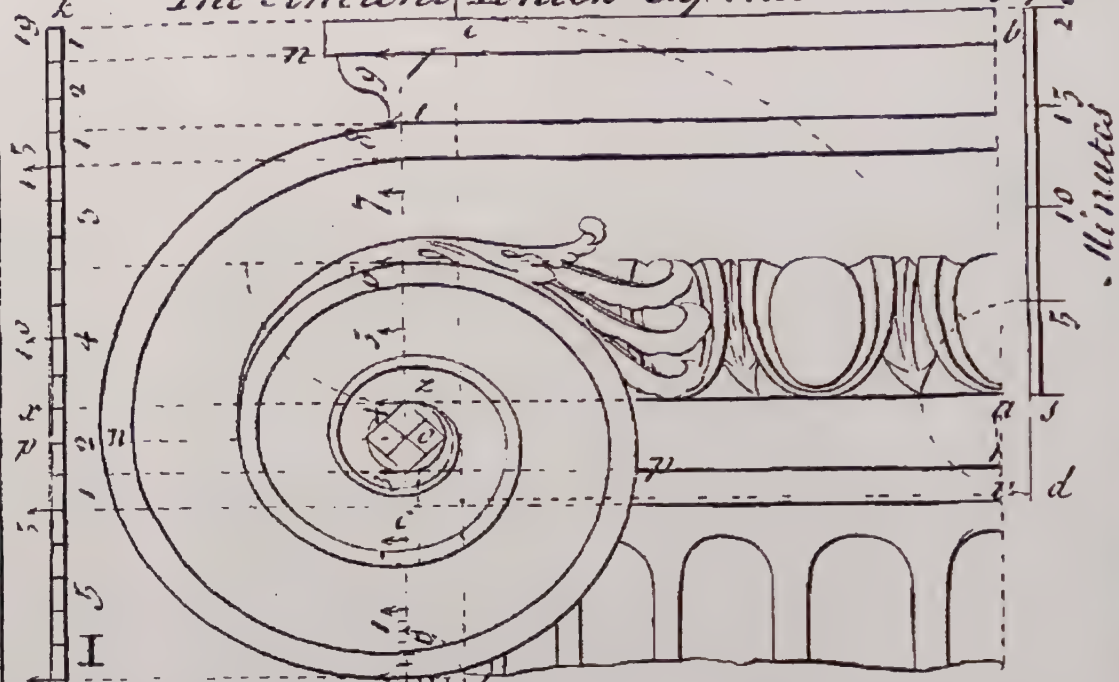


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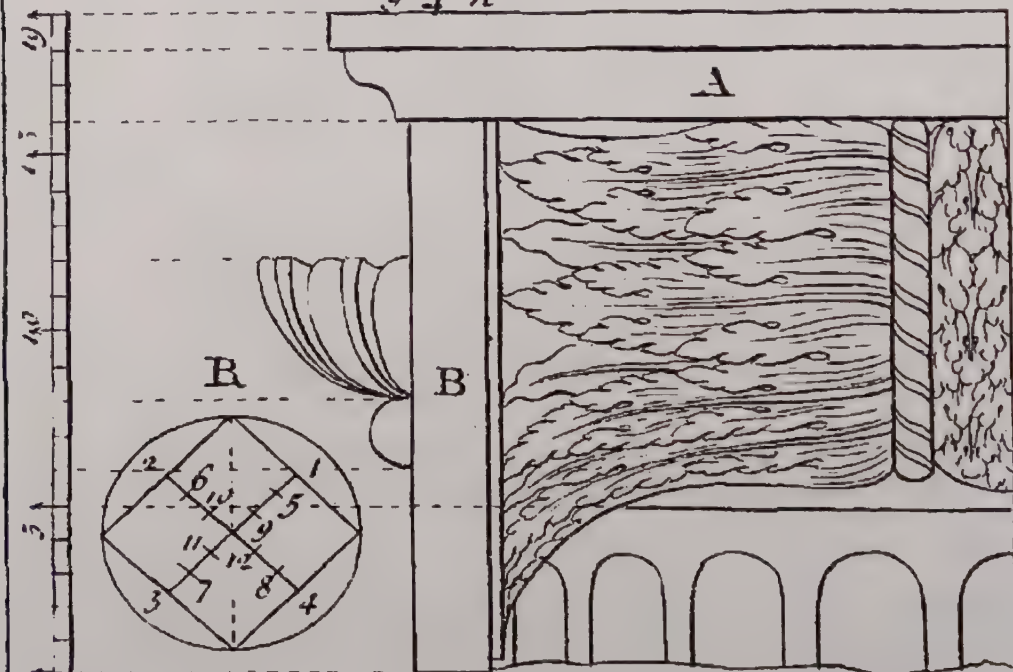
J. T. Sculp

The Ancient Ionic Capital

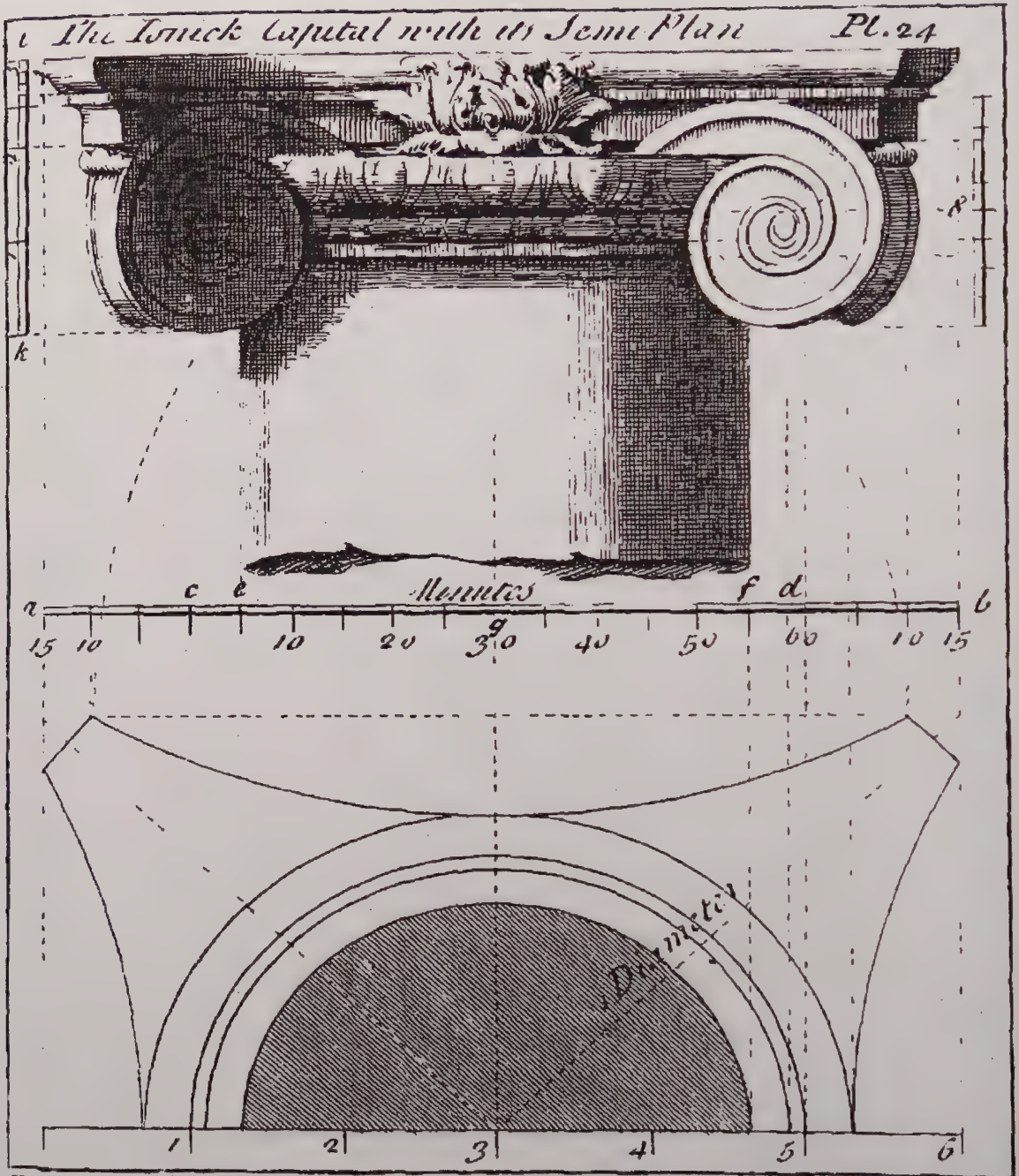
Pl 237



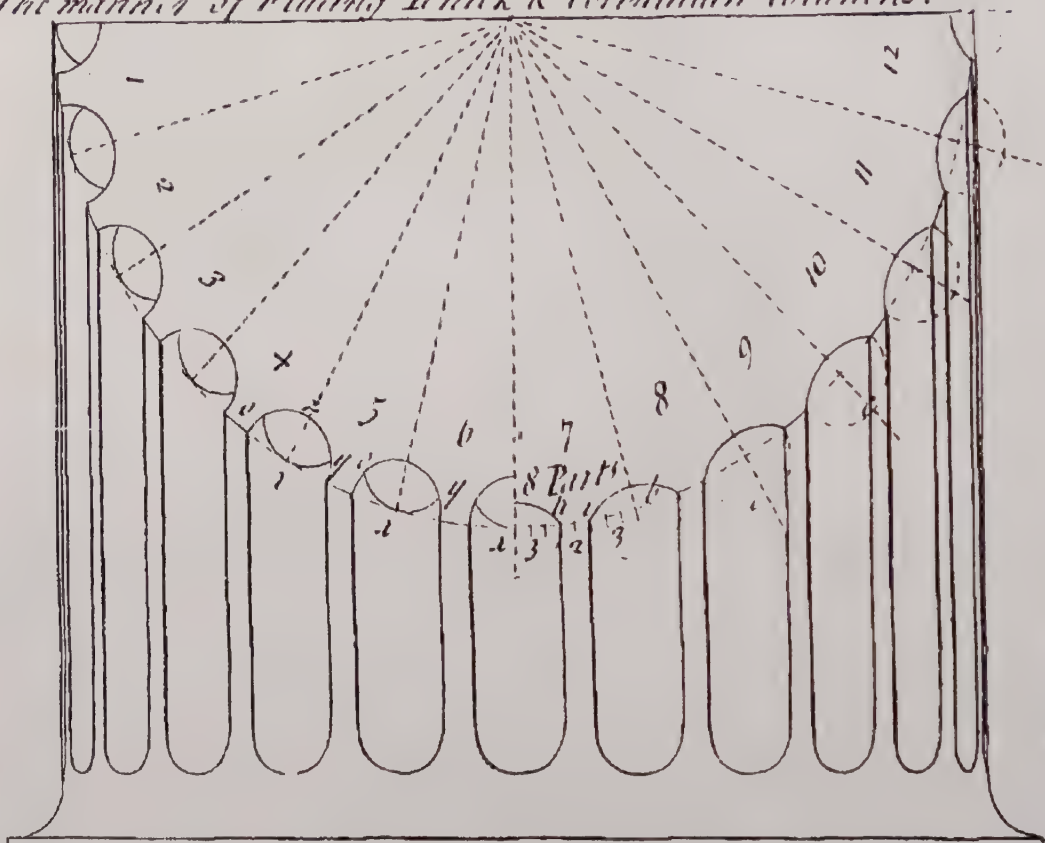
Minutes



I L Sculp



The manner of Plating Ionic & Corinthian Columns.

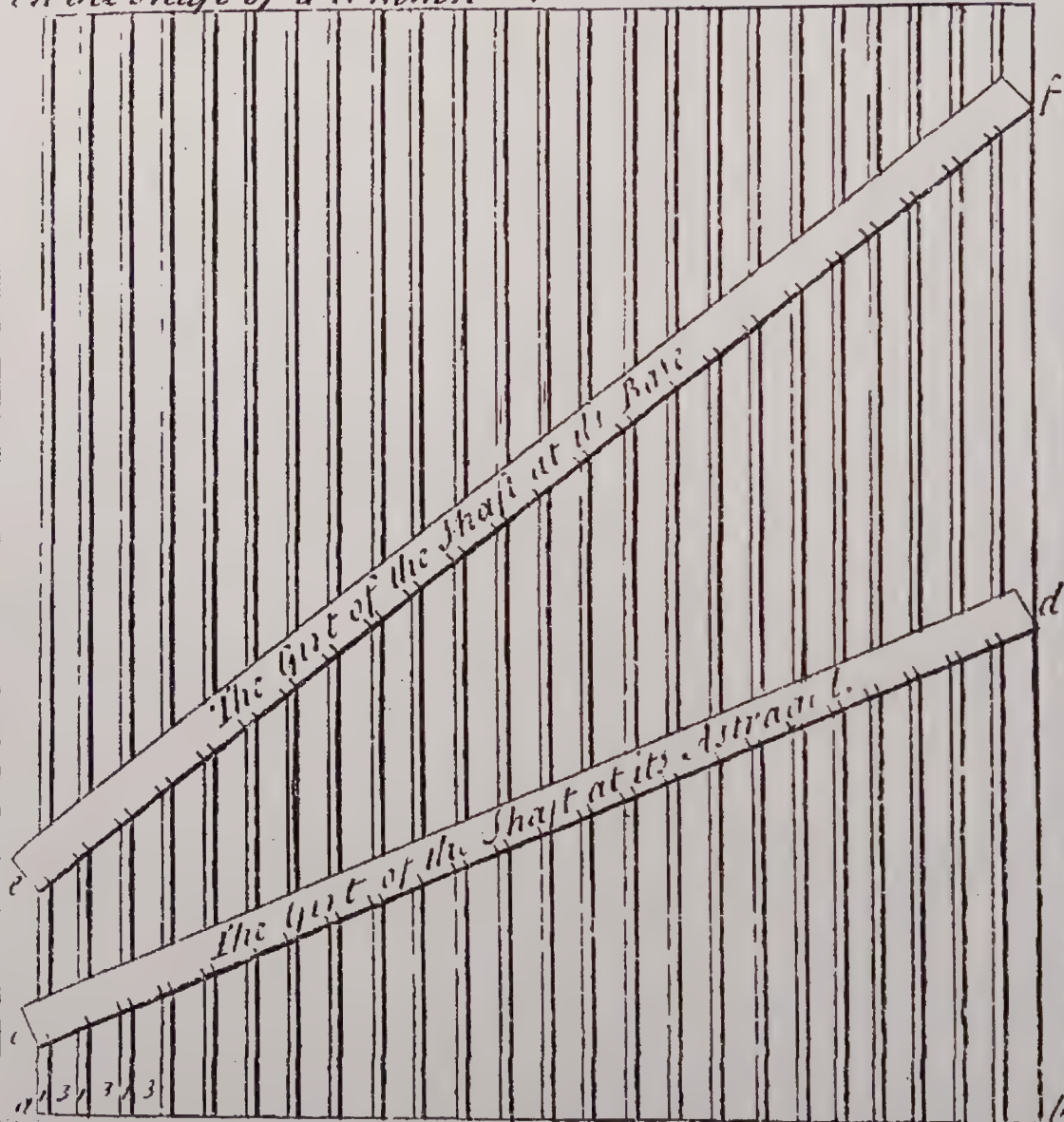


Pl. 25.

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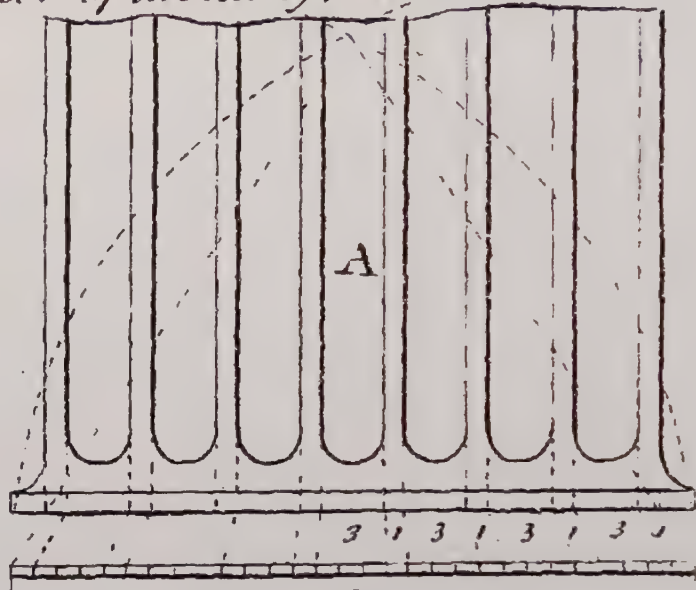
The manner of transferring the Flutes & Fillets
on the Shaft of a Column — Plate 26



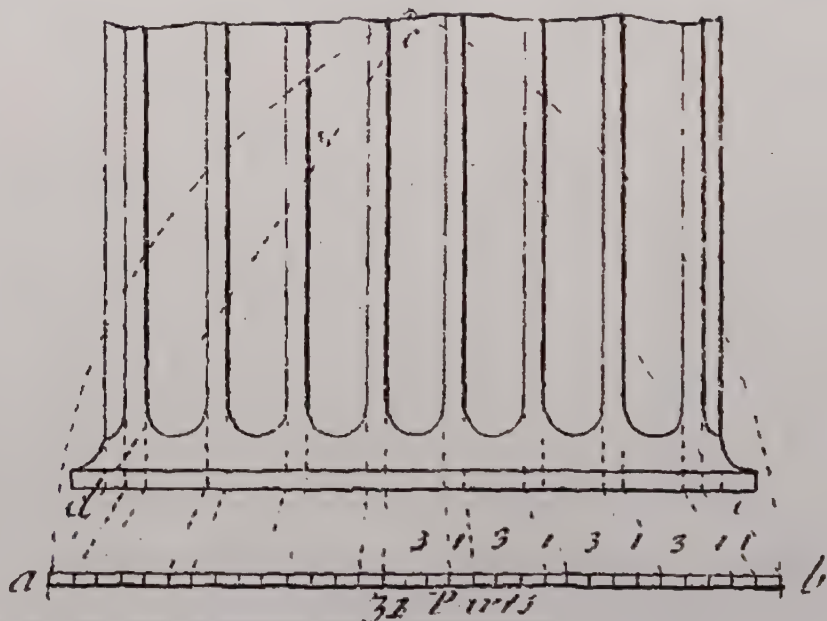
Divide a given length, less than $\frac{1}{2}$ the circumference in c or d
in each part in 4 then 1 is a Fillet & 3 is a Flute —

The Manner of dividing, the Flutes & Pillets of Pilast

Plate 27

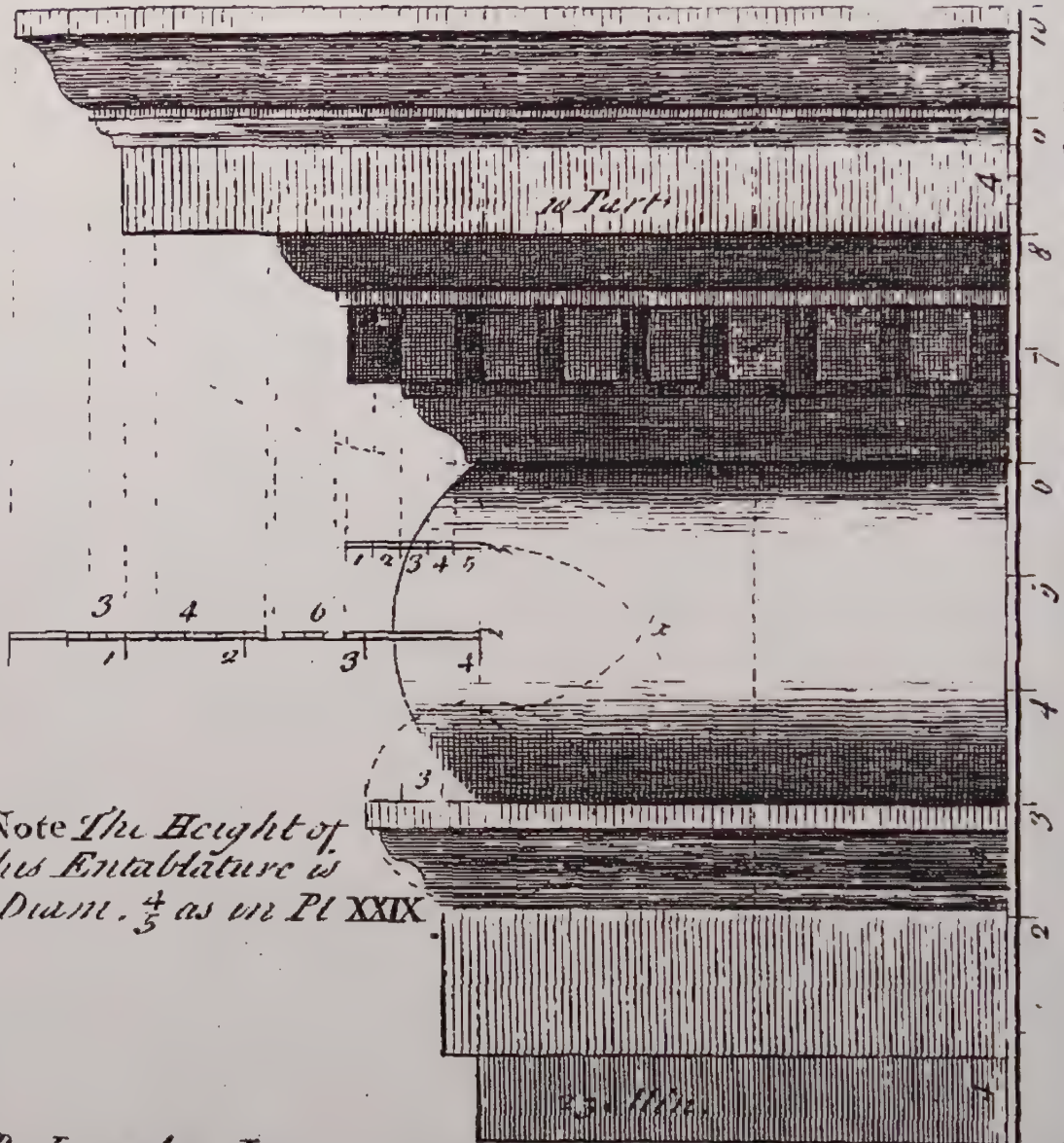


20 Parts



32 Parts

The Ionic Dentul Entablature. Pl. 28

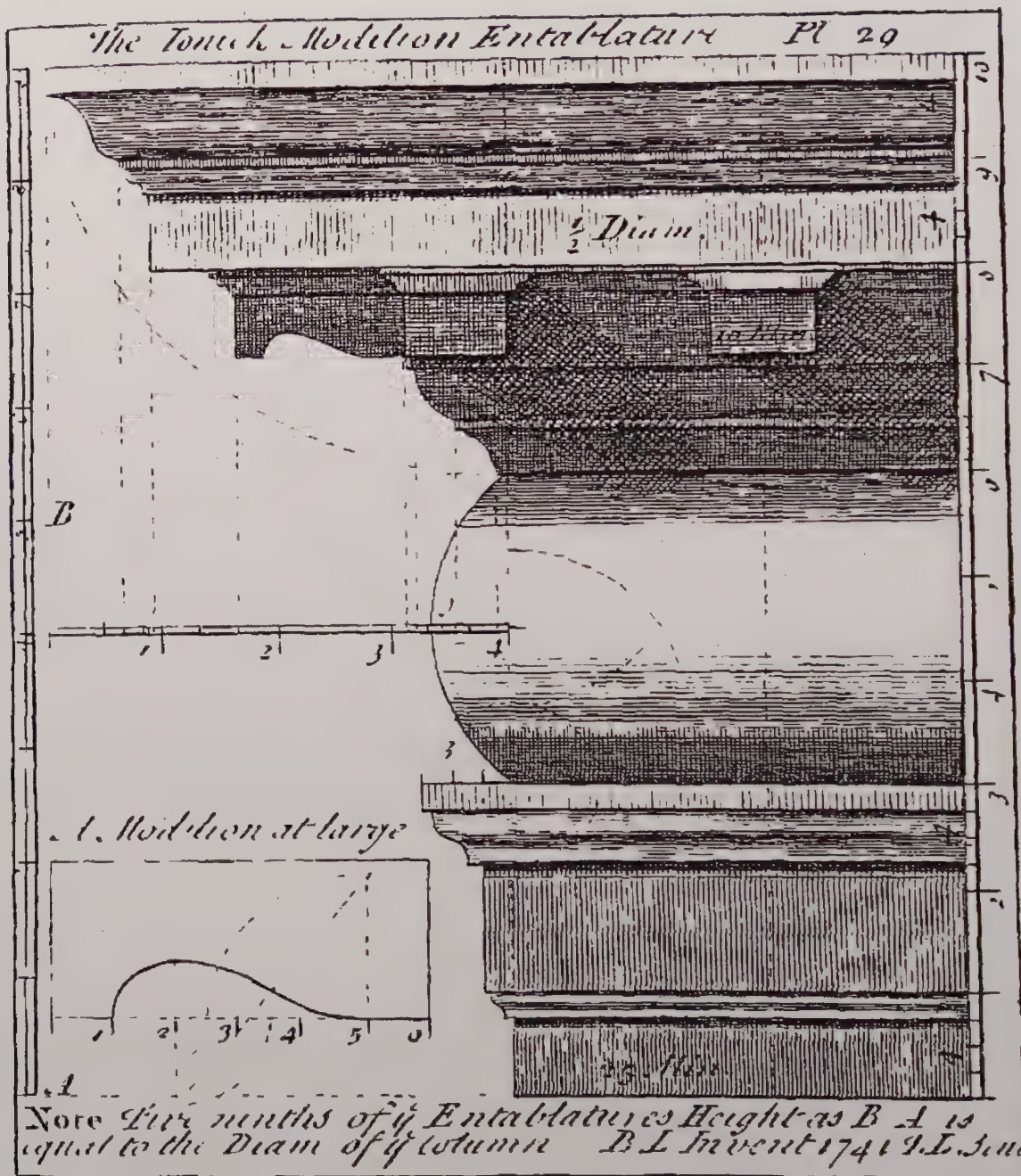


*Note The Height of
this Entablature is
Diam. $\frac{4}{5}$ as in Pl XXIX.*

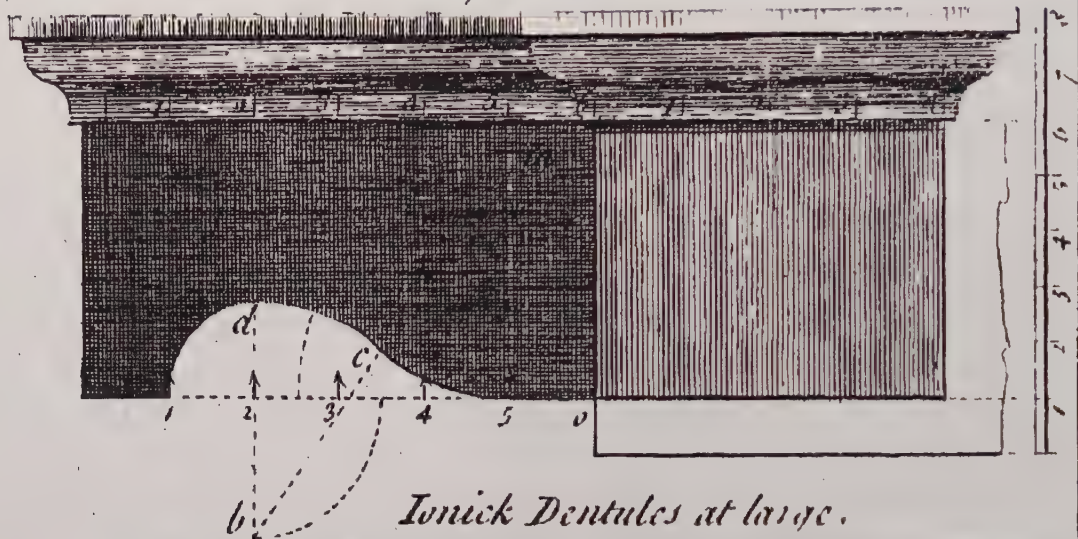
B. Langley Invent 1741

T. L. Sulp

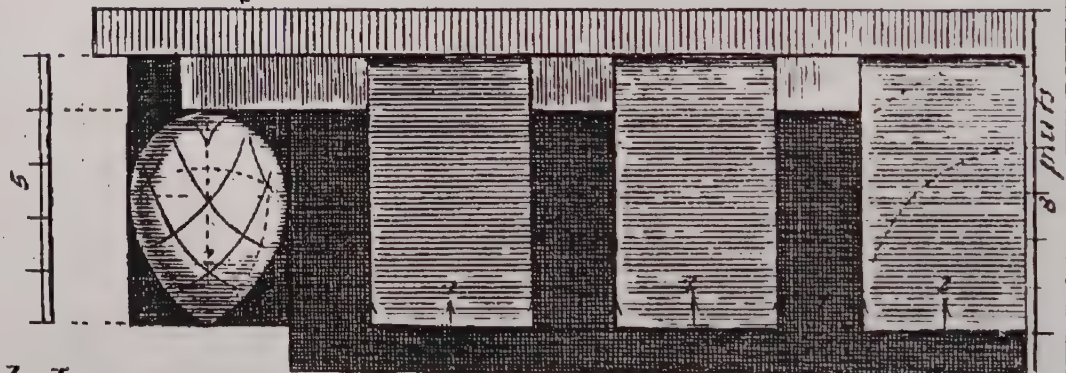
The Touch Modelion Entablature Pl 29



Ionick Modillion at large.



Ionick Dentules at large.



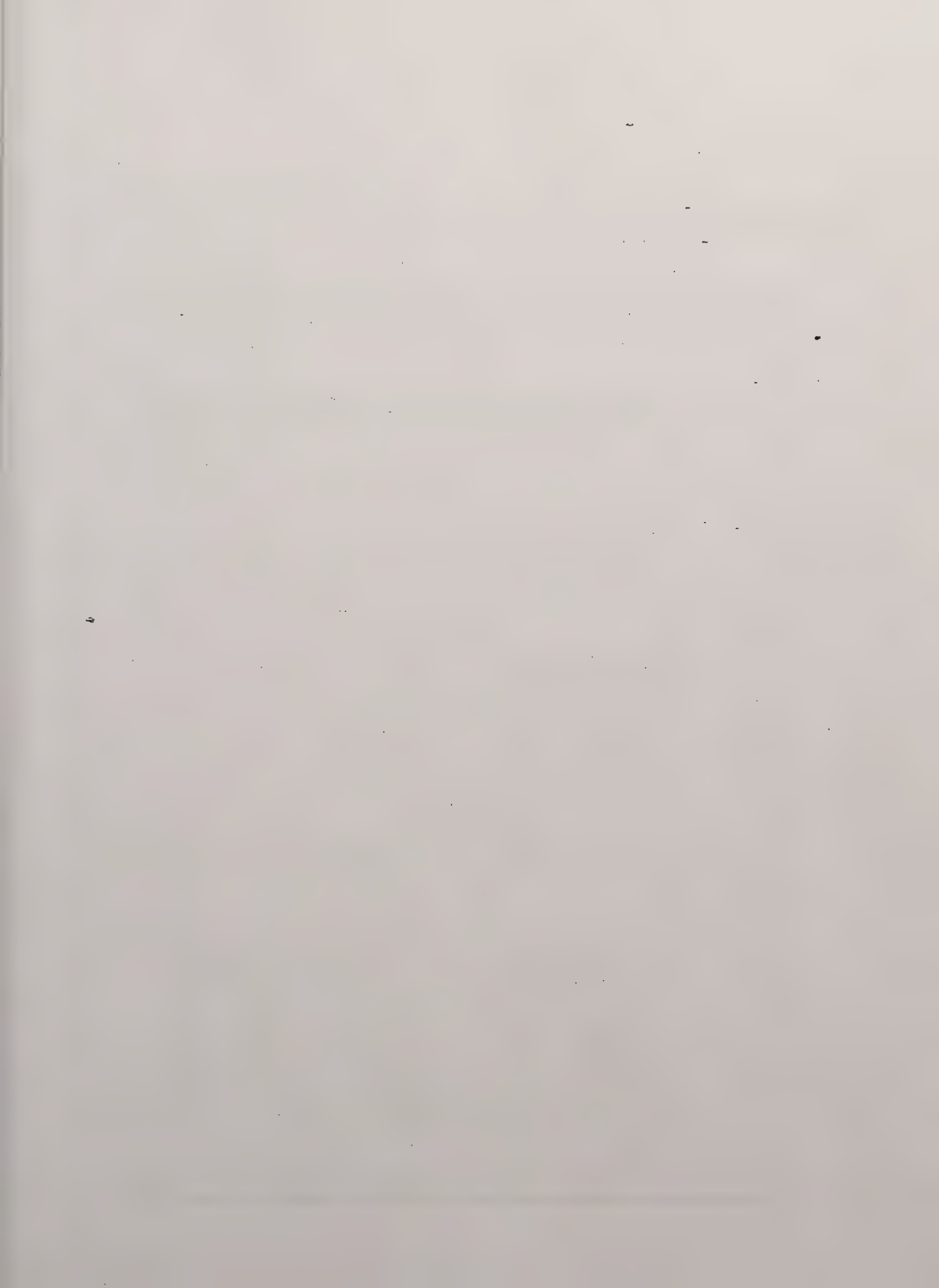
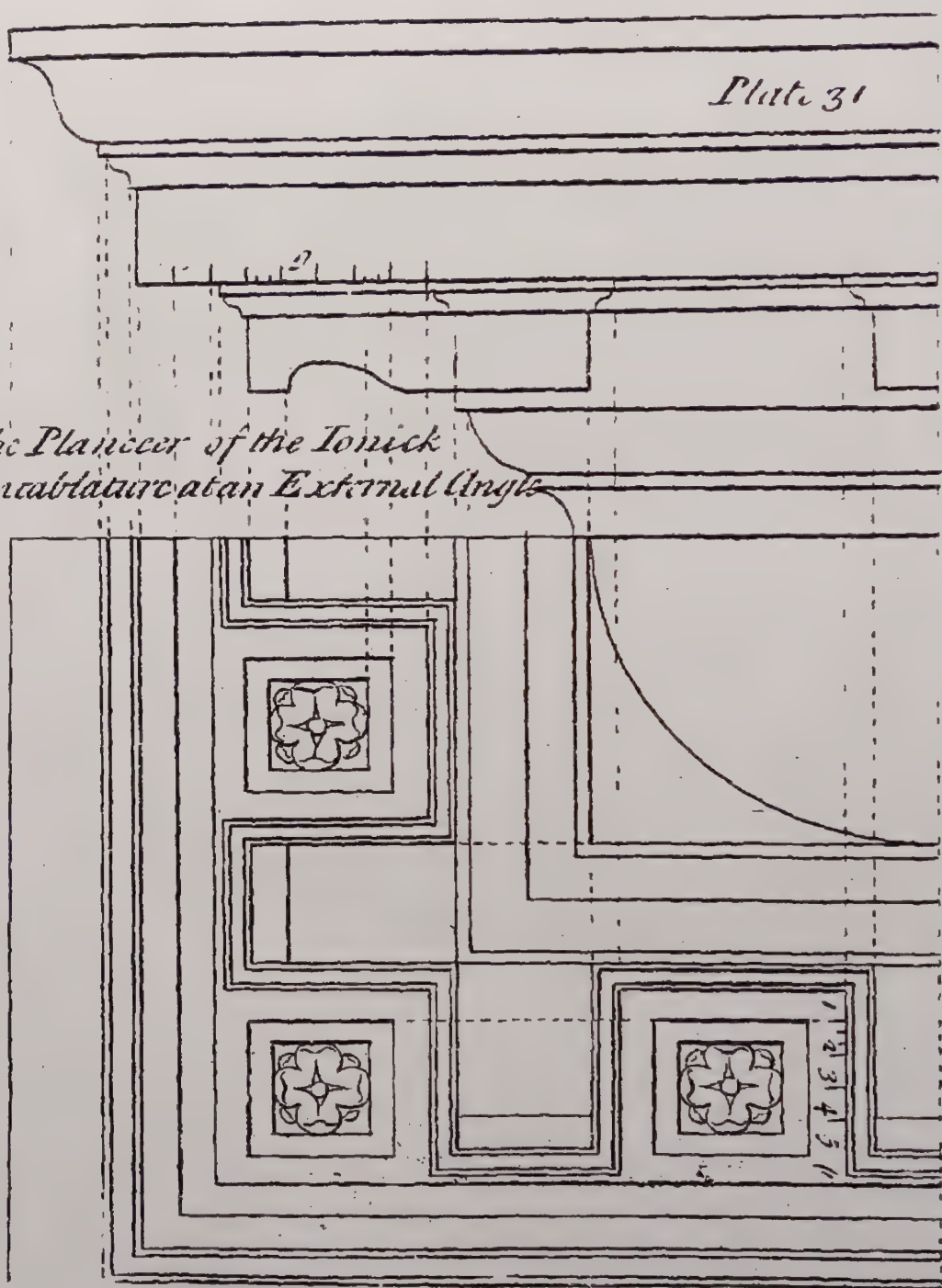


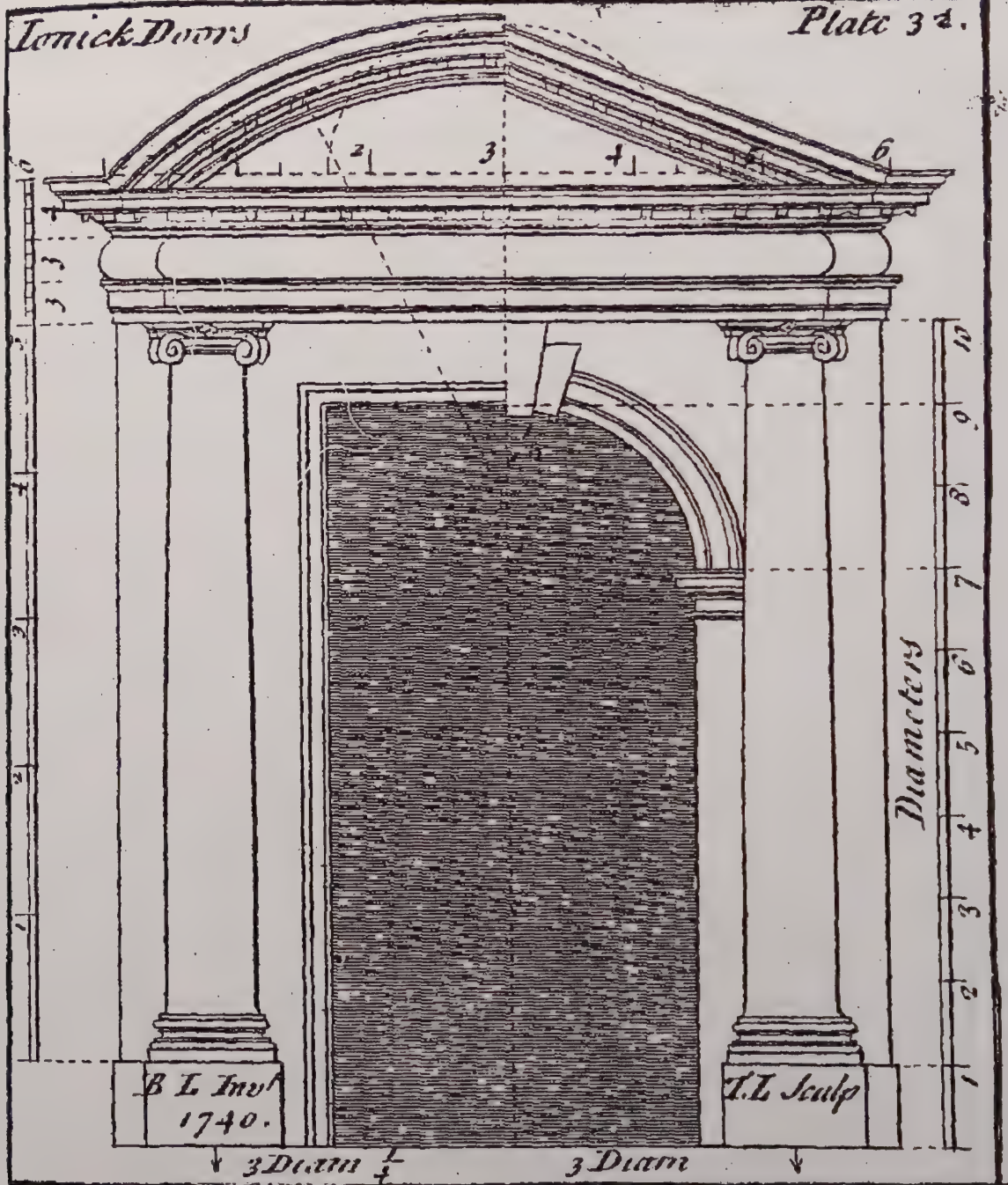
Plate 31

*The Planiceer of the Ionick
Entablature at an External Angle*



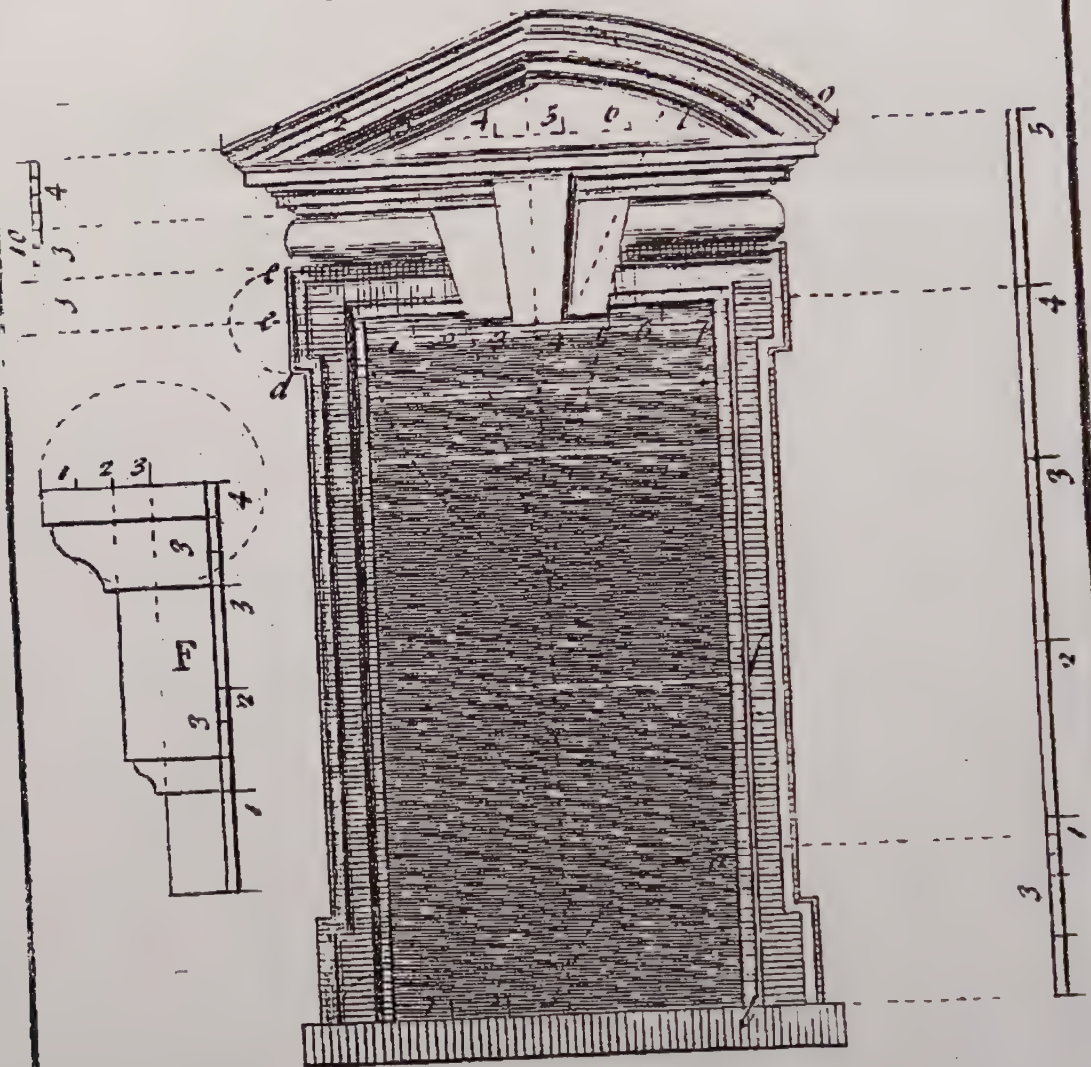
Ionick Doors

Plate 32.



Ionick Window

Plate 33



B. Langley Invent 1741

T.L. Sculp.

Tonick Inter columnations, for a Medelson temple



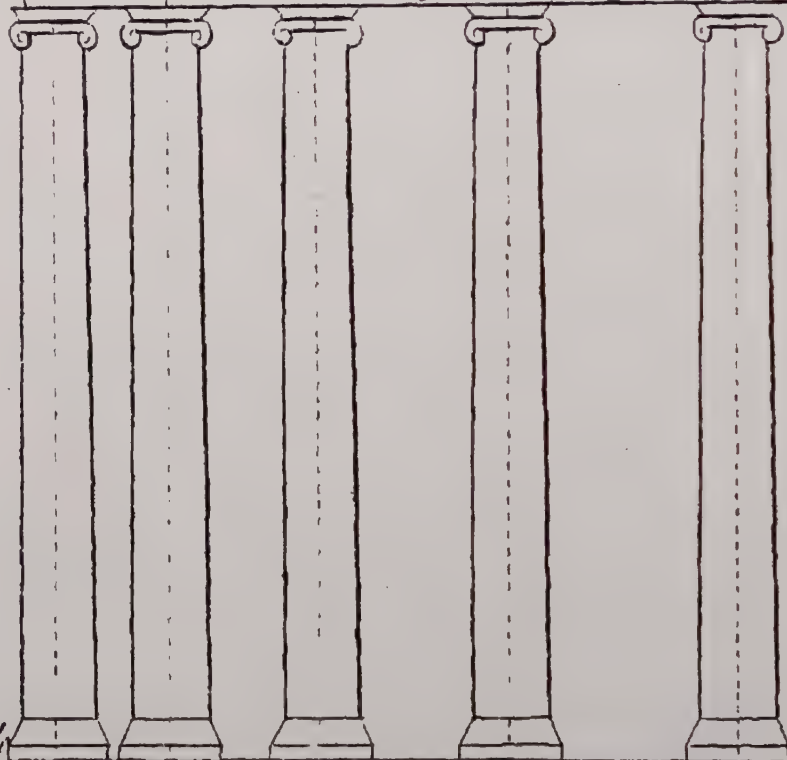
Pl. 34.

B.J. Inv't 1741 | 1 D $\frac{1}{2}$ | 2 Diam | 2 D $\frac{1}{2}$ | 3 D. | 3 Diam $\frac{1}{2}$ | *T.L. Sulp*

Ionick Intercolumniations for a Dentule cornice.

12 Dent. 16 Dent. 20 Dent. 25 Dentules

Divide each Semediameter in 12 give 2 a Dentule & 1 to an Interval.



B. Laugle

En 174 . 1st Diam. $\frac{1}{2}$ 2nd Diam. $\frac{1}{2}$ 3rd Diameters

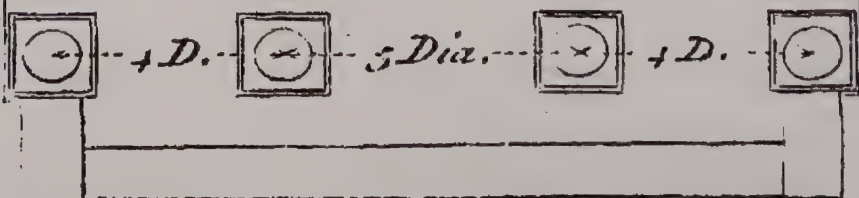
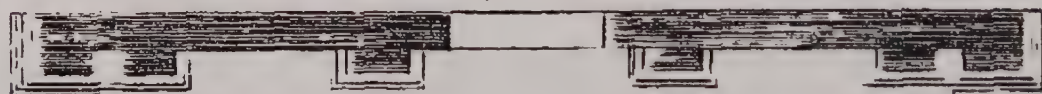
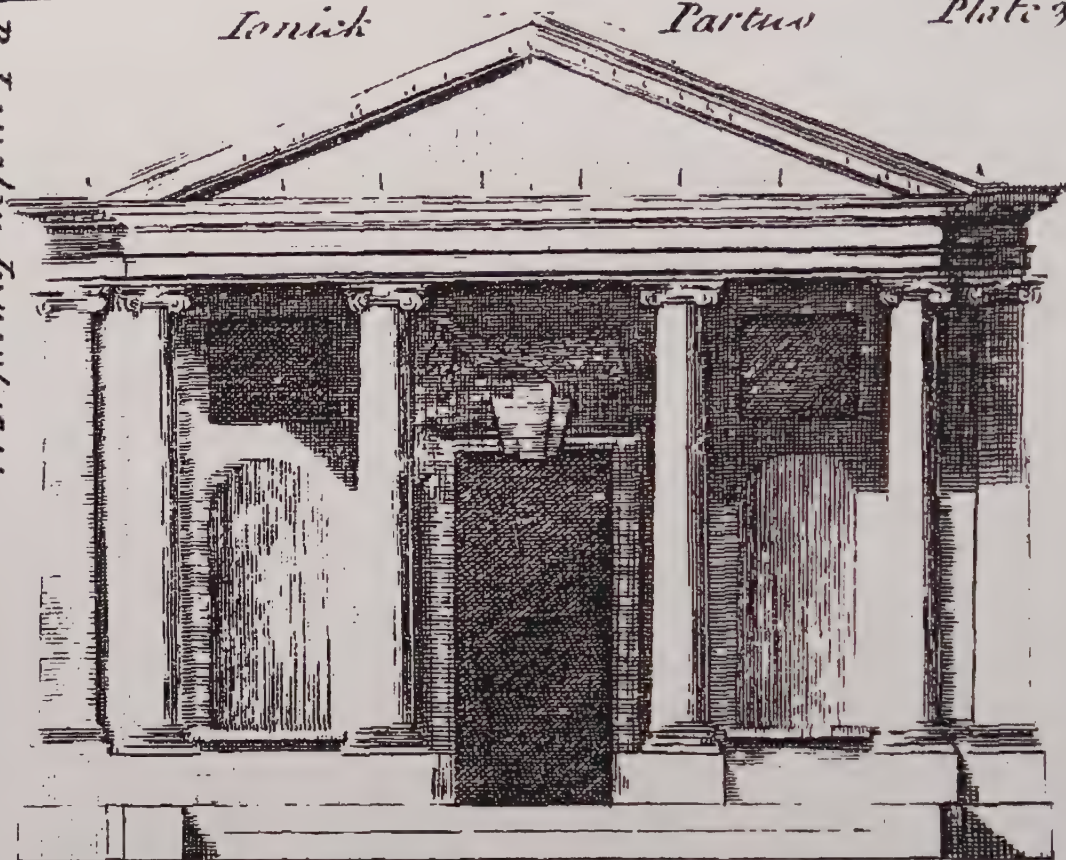
L.L. Sculp

Ionick

Partus

Plate 30

B. Landrey Invent 1741.

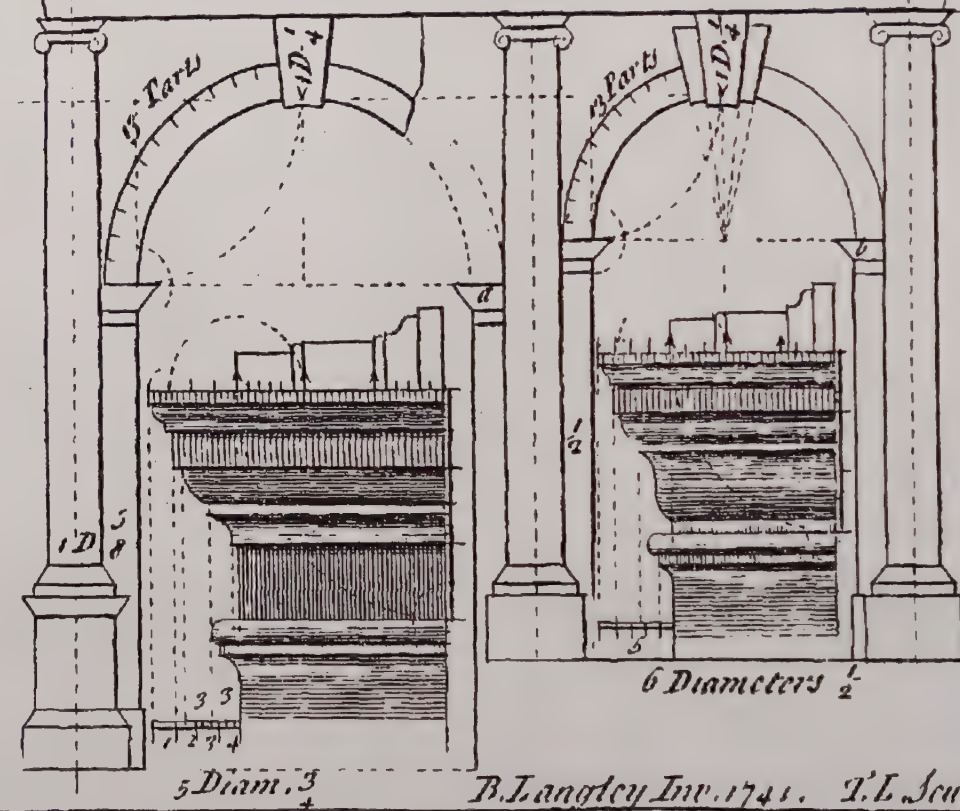


J. L. Sculp

Ionick Arches & Imposts.

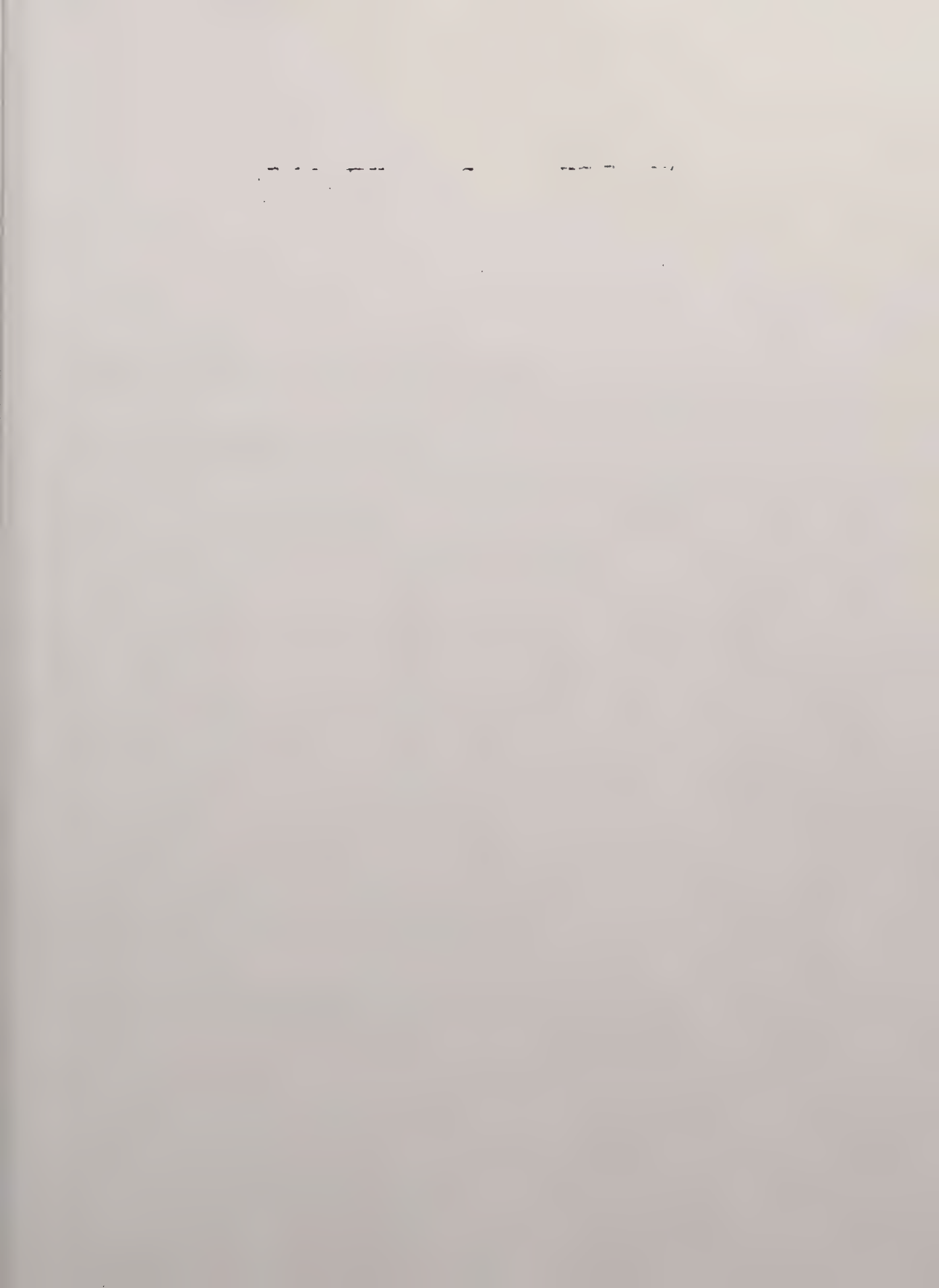
16 Modelions.

13 Modelions.



Pl. 37.

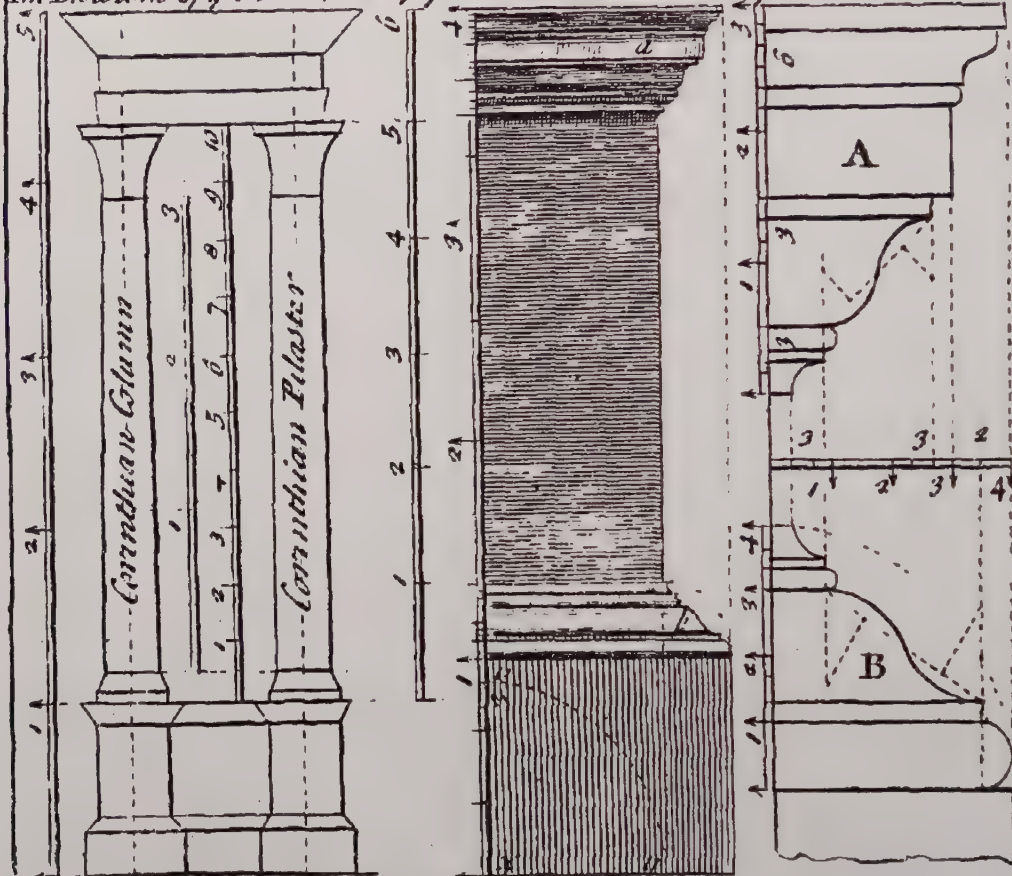
B. Langley Inv. 1741. T. L. Sculp.



Ionick . heads .

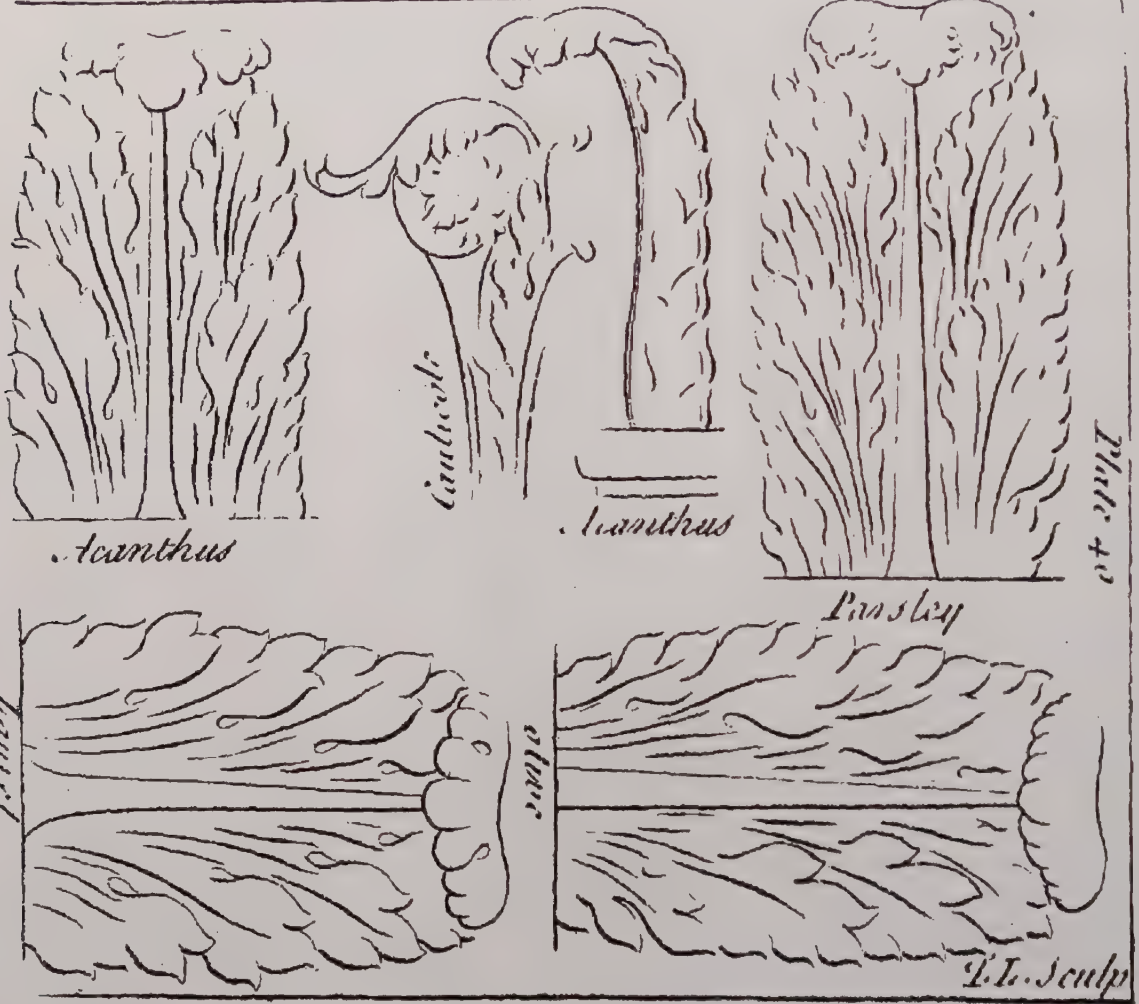


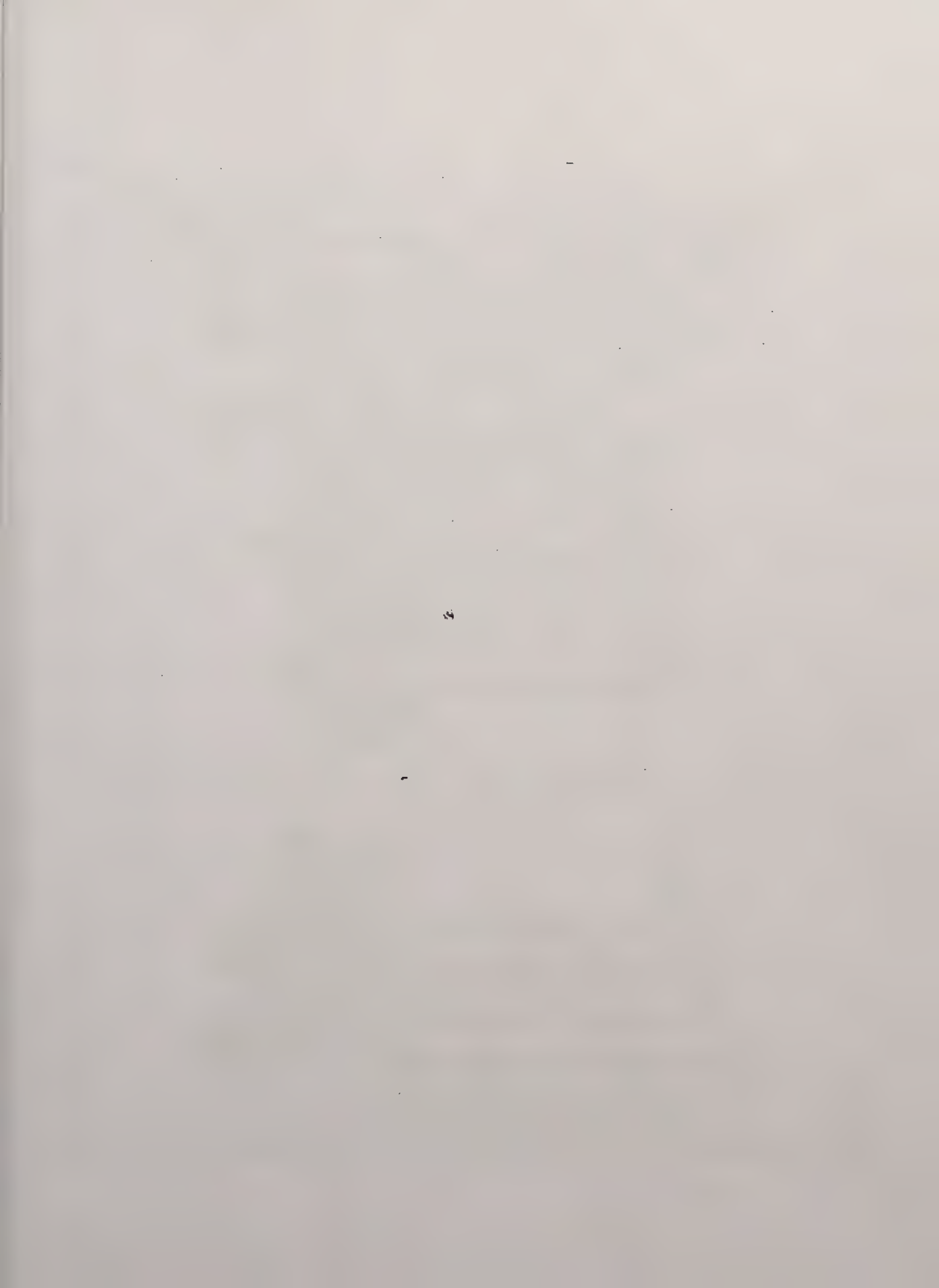
The Divisions of 4 Gen Parts of 4 Corinthian Order with 4 Pedestal & its Pth at large



Pl. 39

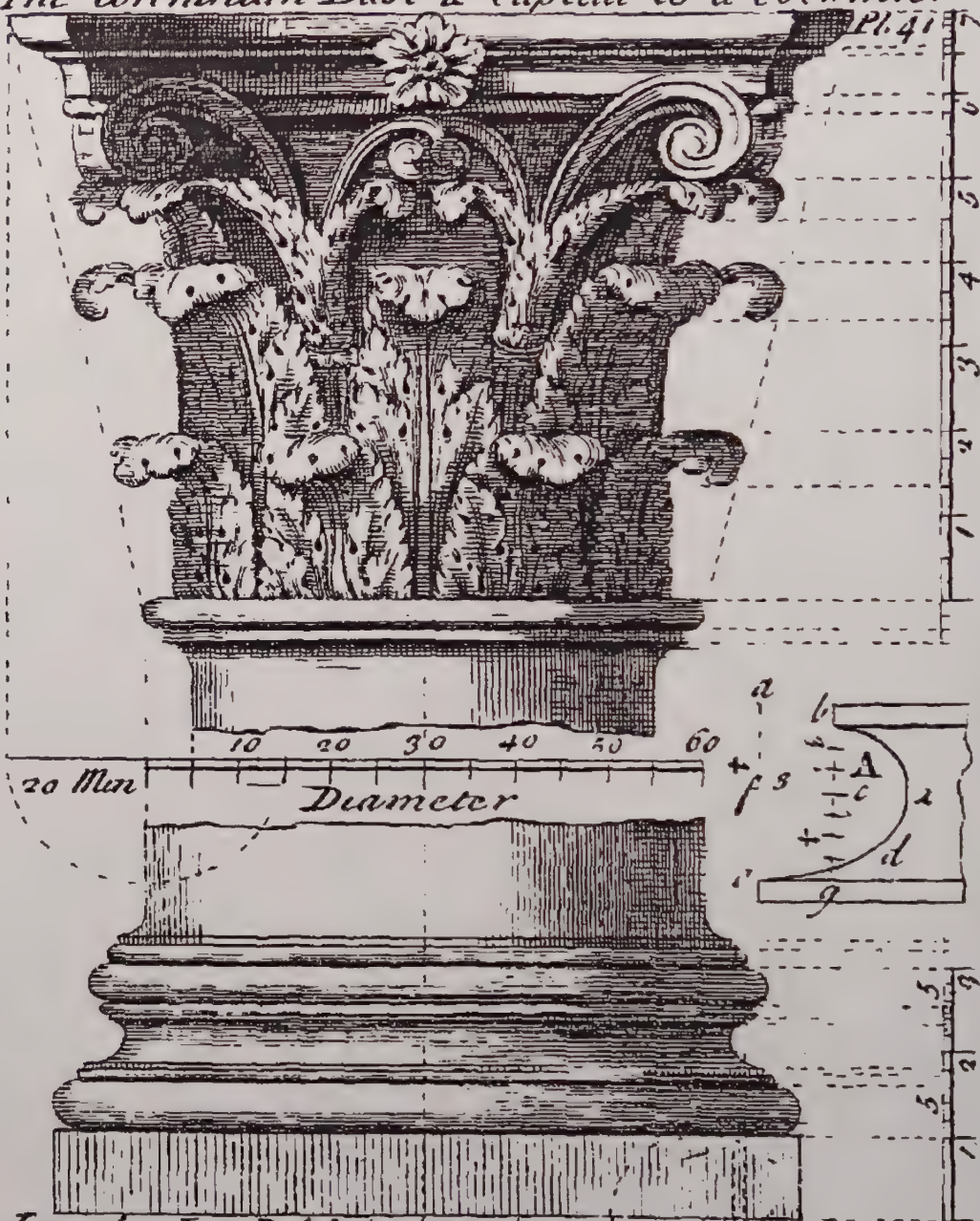
J. T. Smith



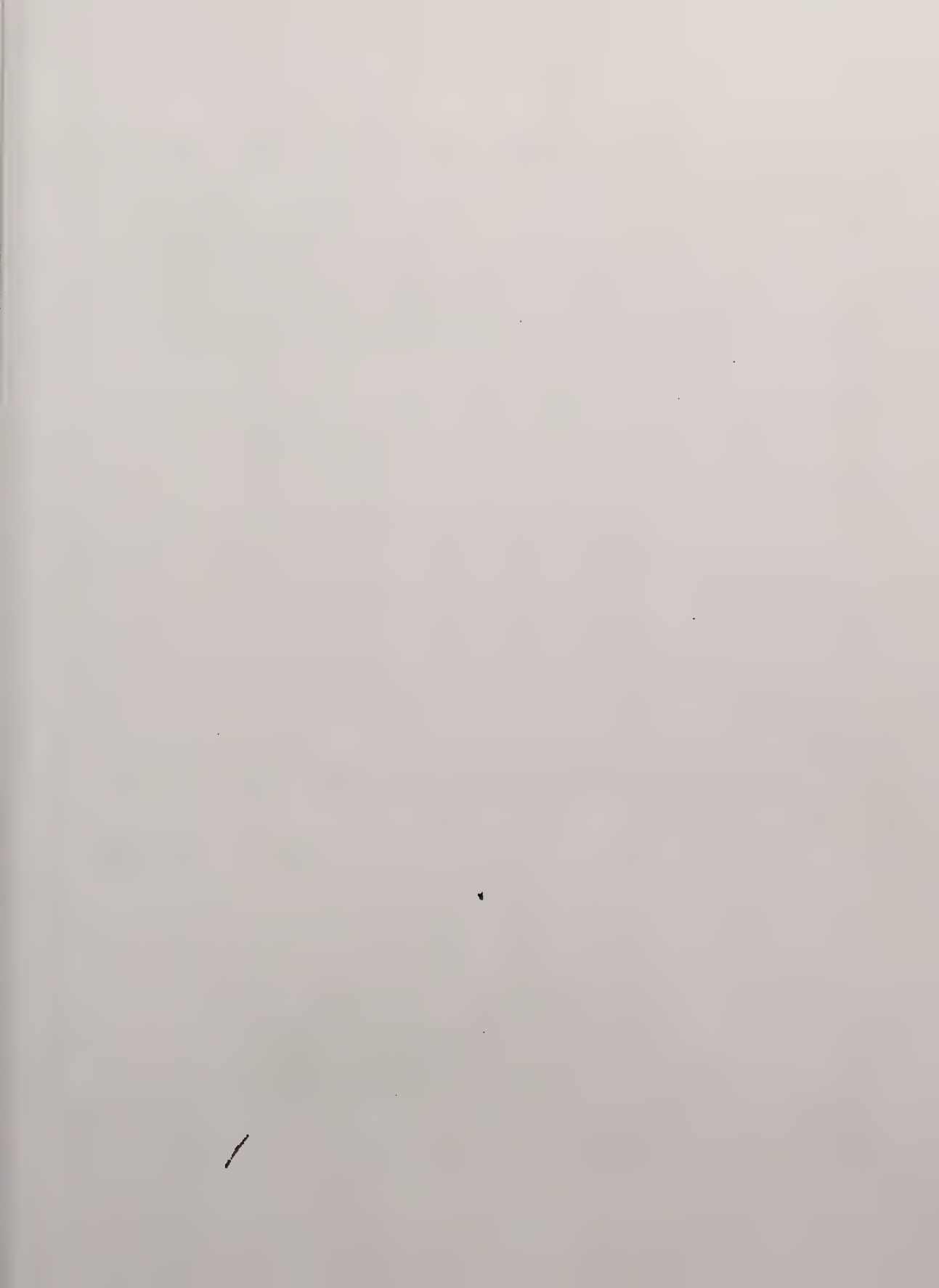


The Corinthian Base & Capital to a Column.

Pl. 41

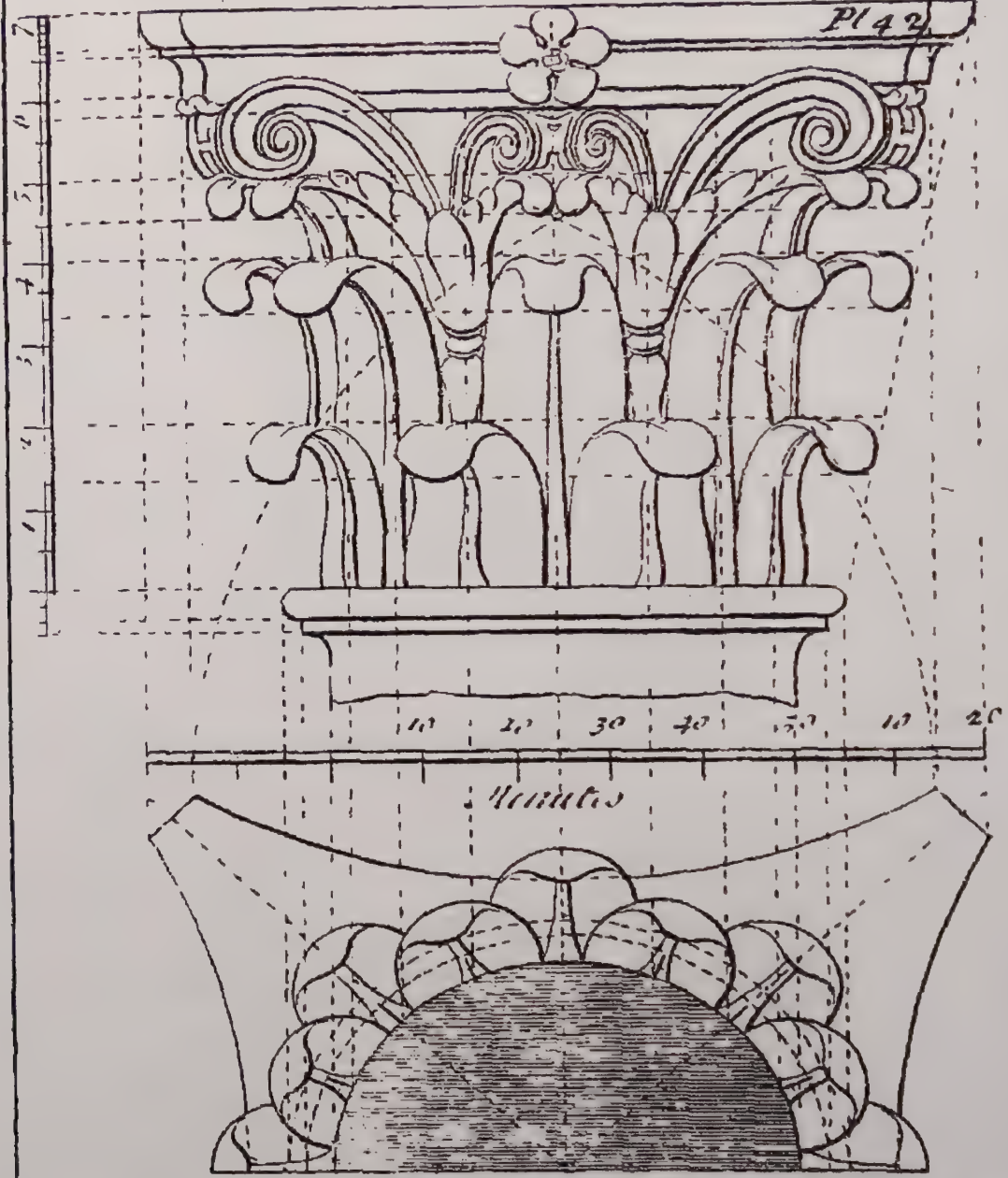


The Langley Inv Del & Scul 1741



The Corinthian Capital with its Plan for a Column.

Pl 42

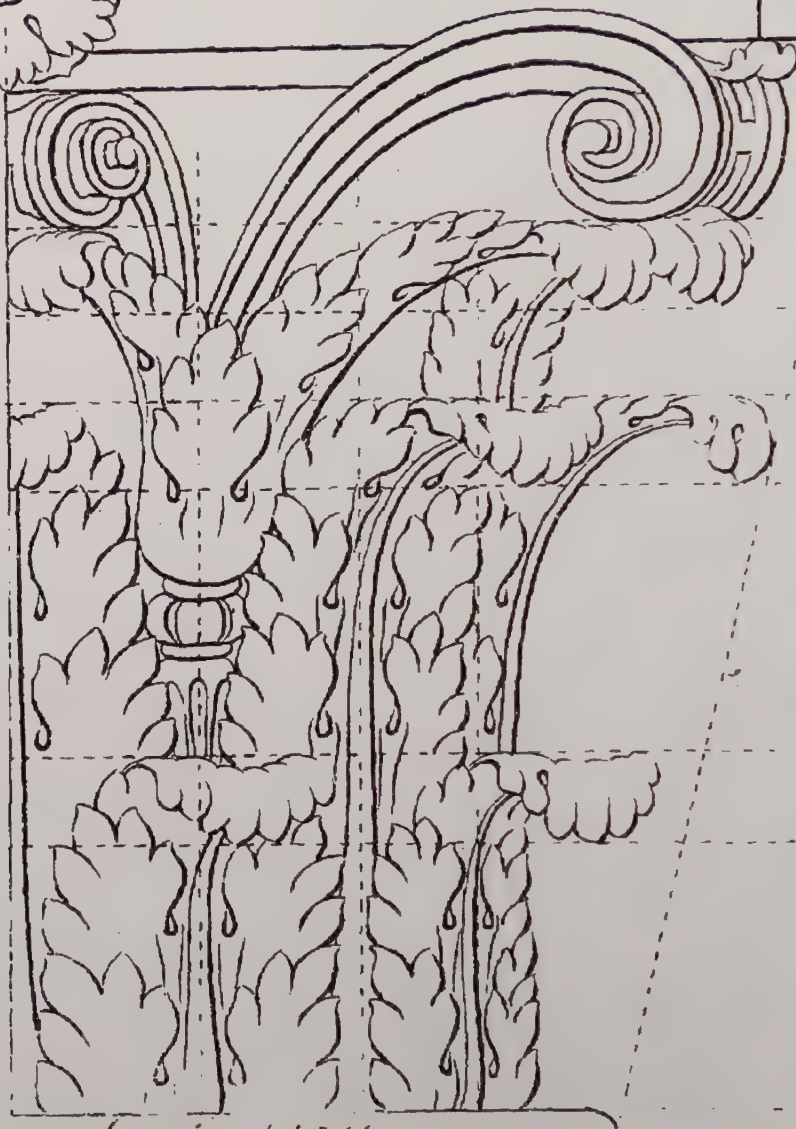


Batty Langley Invent 1741

T. L. Sculp

Corinthian Capital for a Column of large

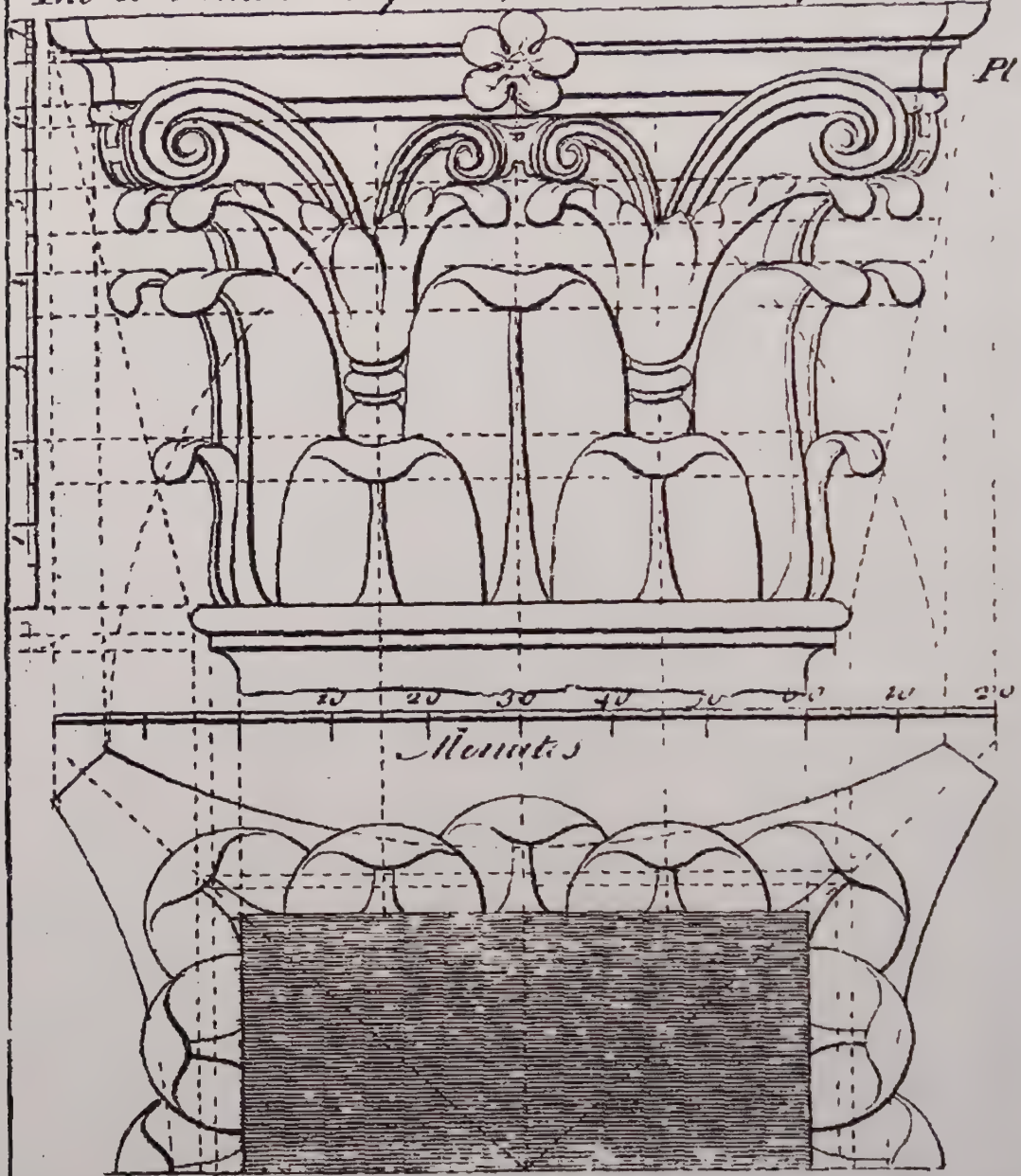
Pl 43



J. T. Sculpy

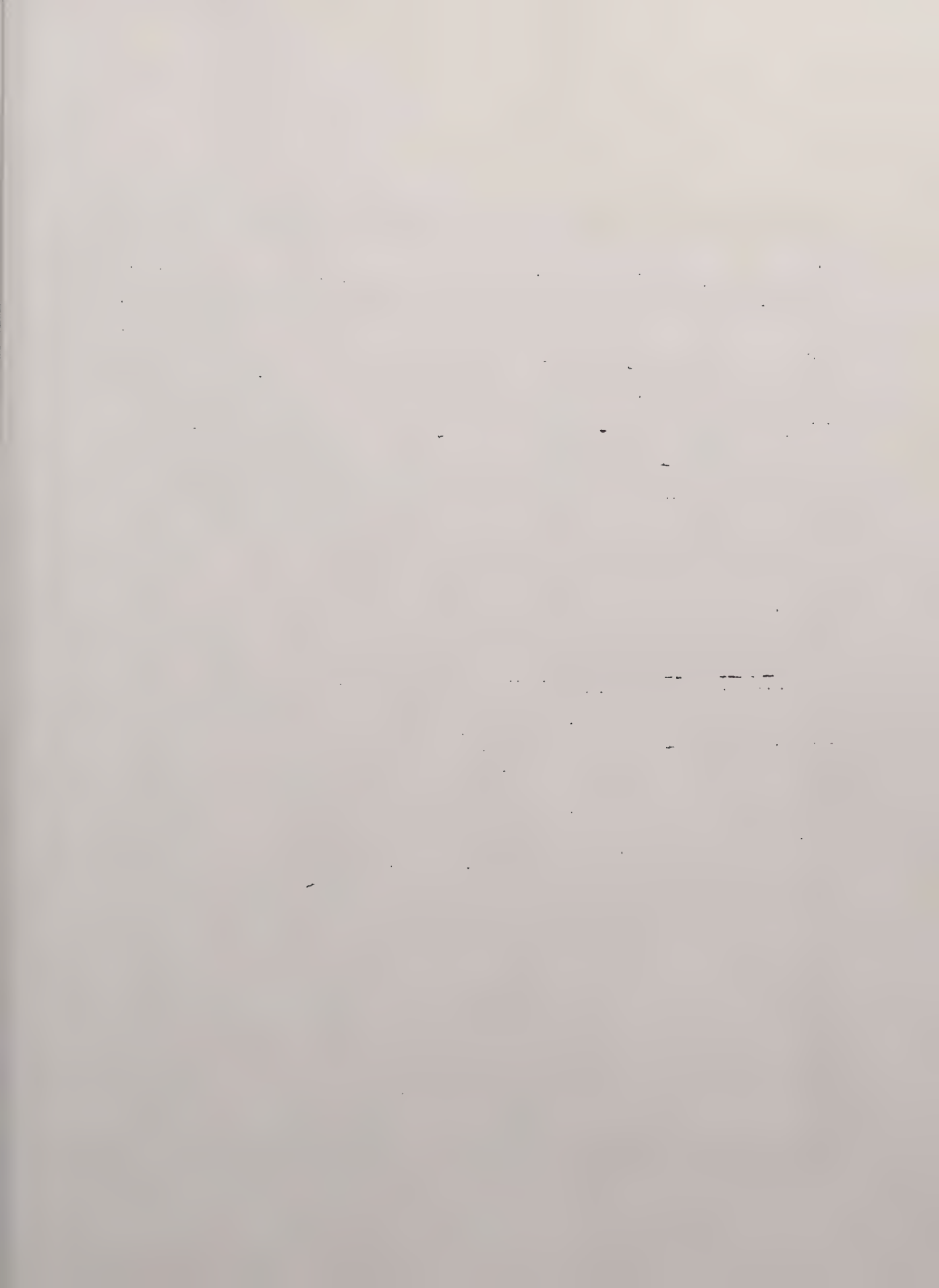
The Corinthian Capital, with its Plan for a Pilaster

Pl 44



Batty Langley Invent 1741

T. L. Sculp



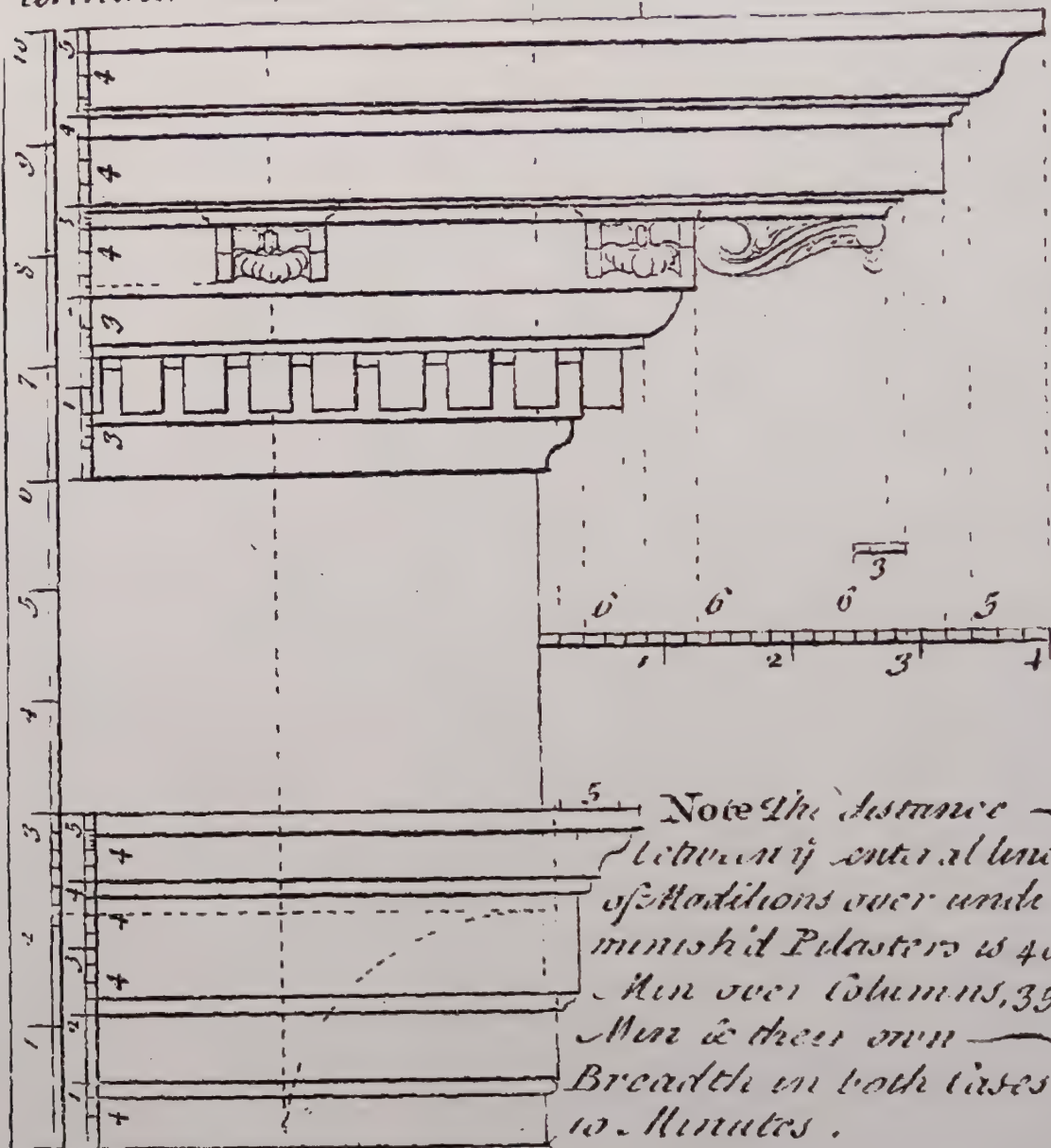
Corinthian Capital for a Pilaster, at large.

Pl. 45



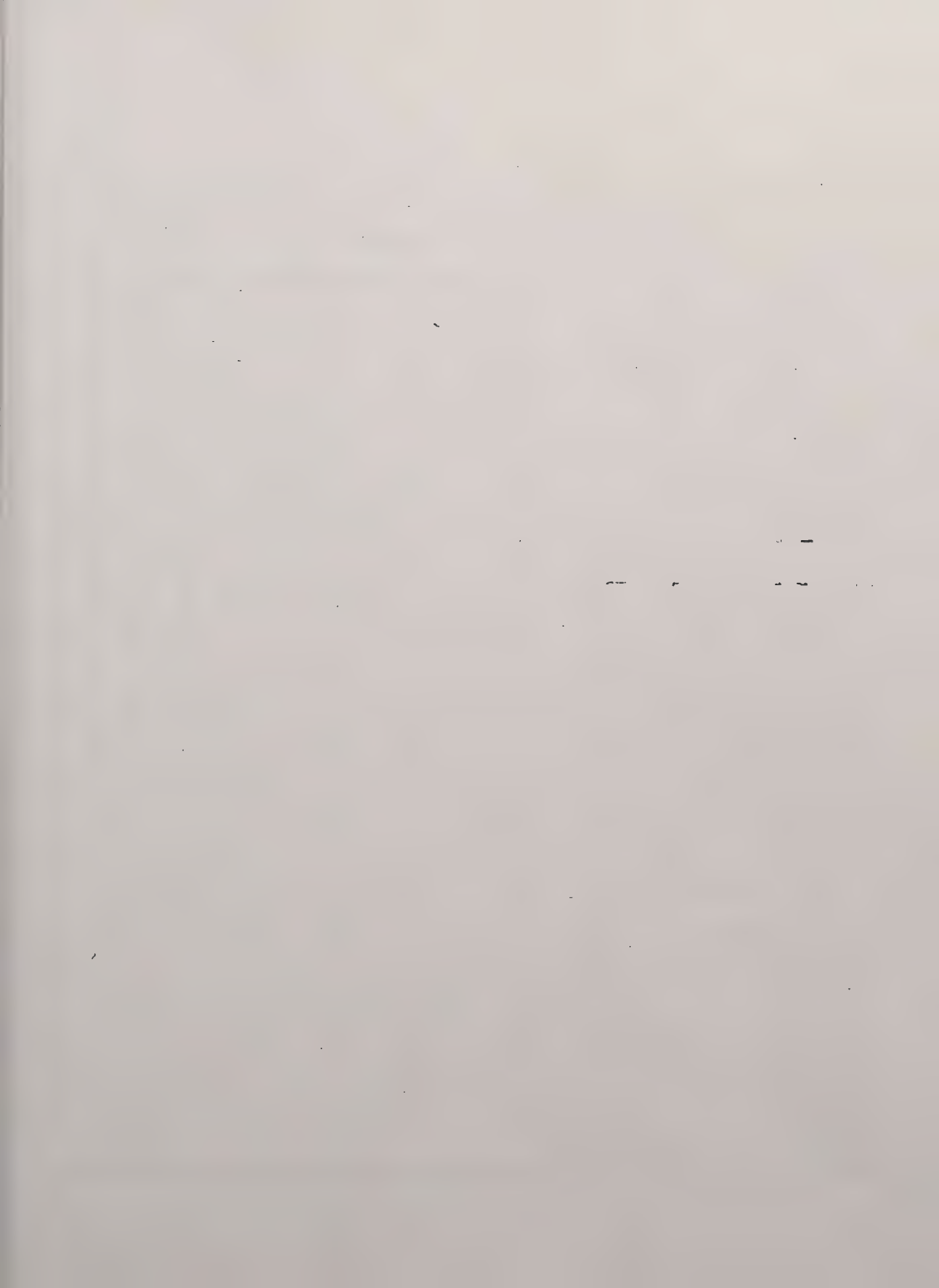
R. Latour & Son 1741

G. L. Sculp.

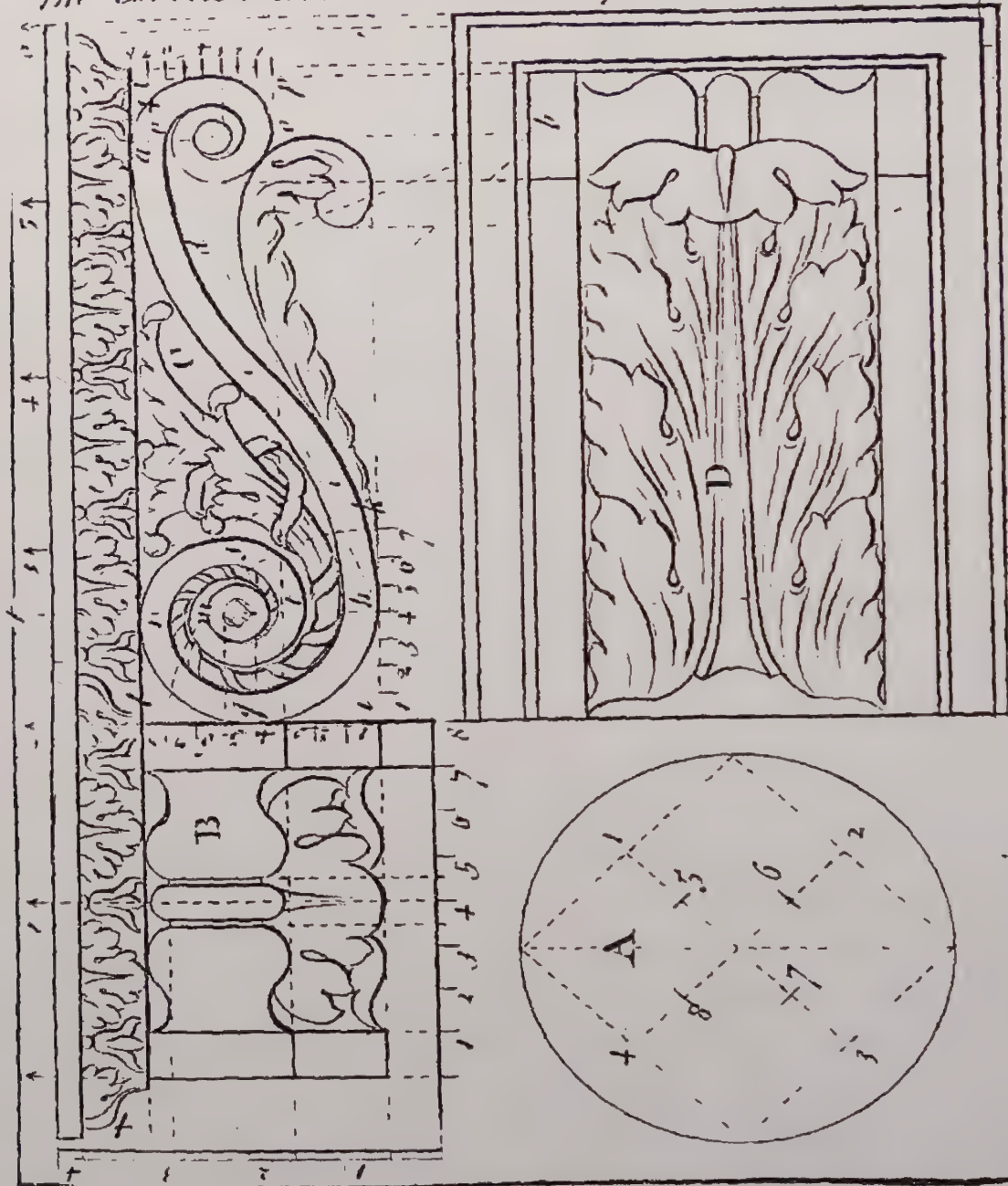


Note the distance between the centers of modillions over undecorated pilasters is 40 Min over columns, 35 Min & their own Breadth in both cases 10. Minutes.

25. Min.

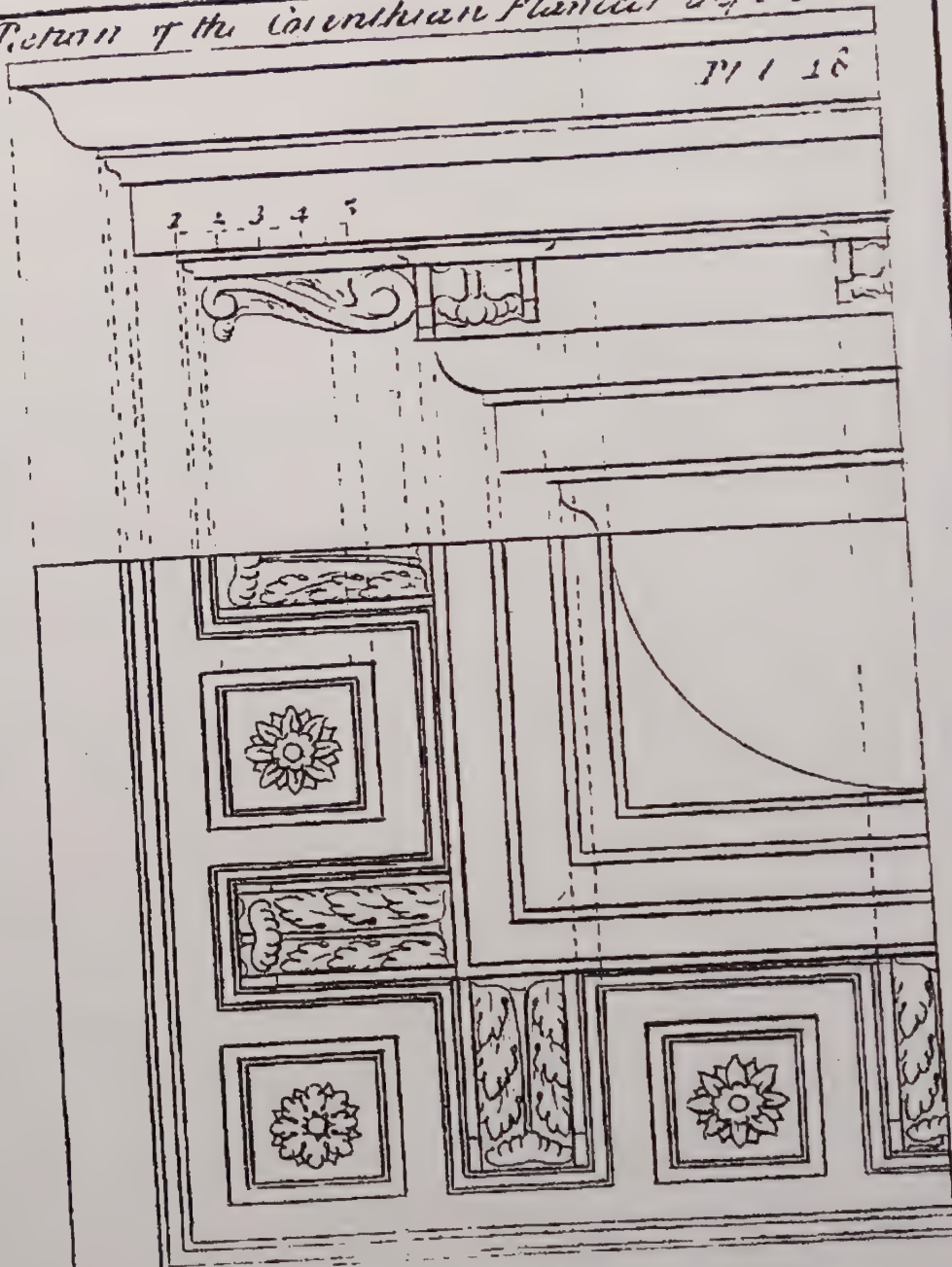


The Corinthian Modelled as explain'd. Plate 47.



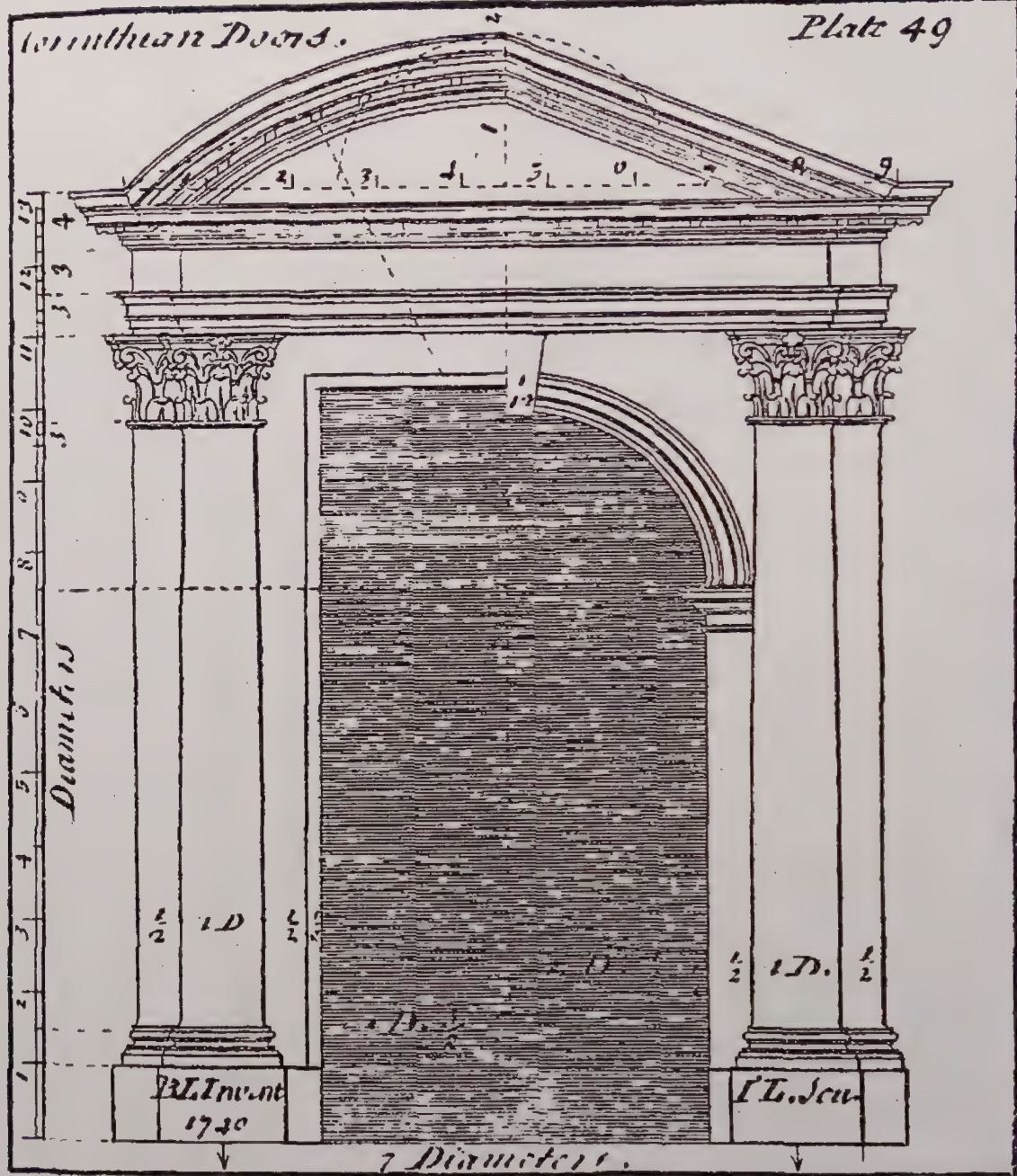
The Return of the Corinthian Flances and

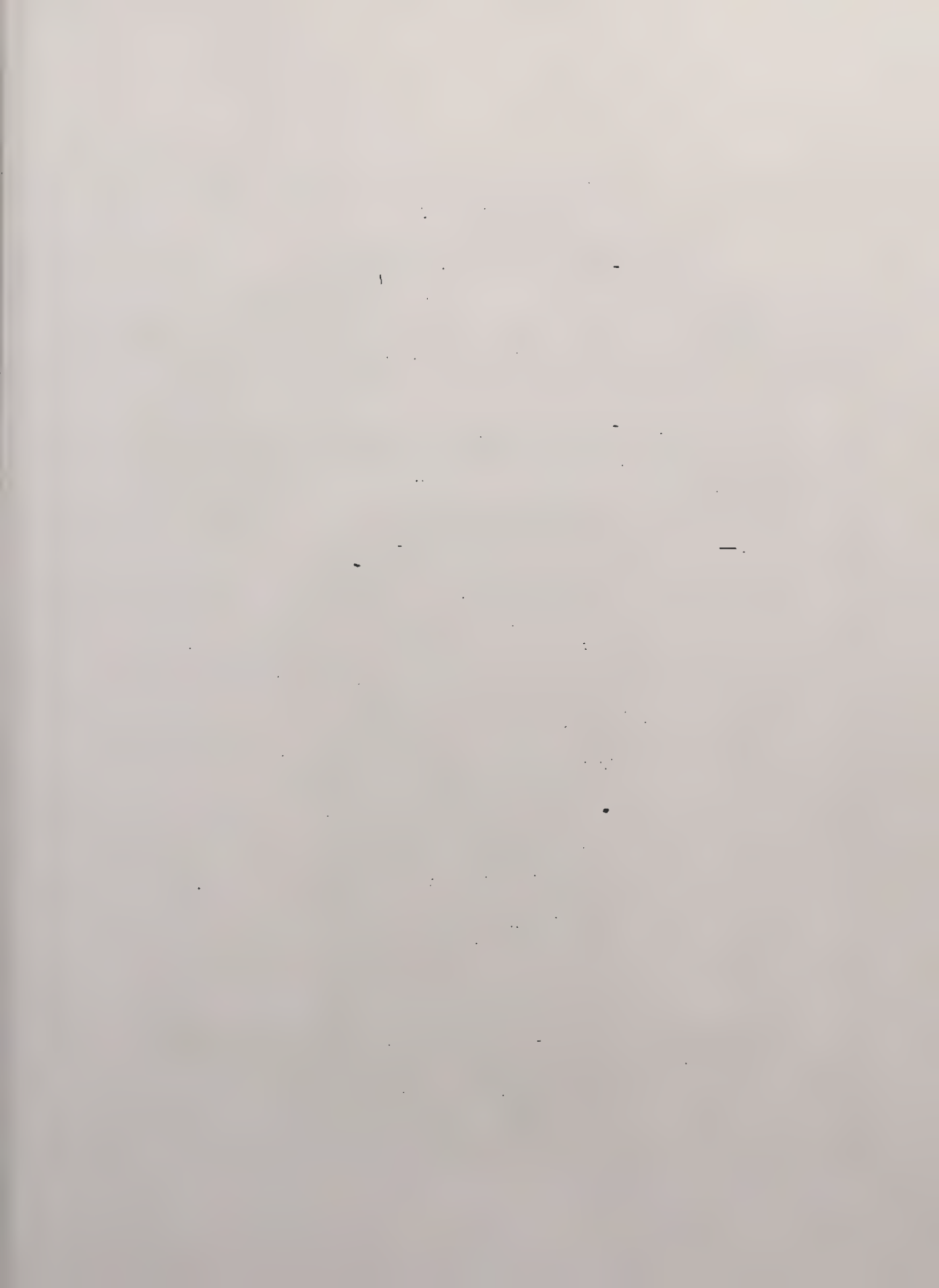
Pl 1 16



Corinthian Doors.

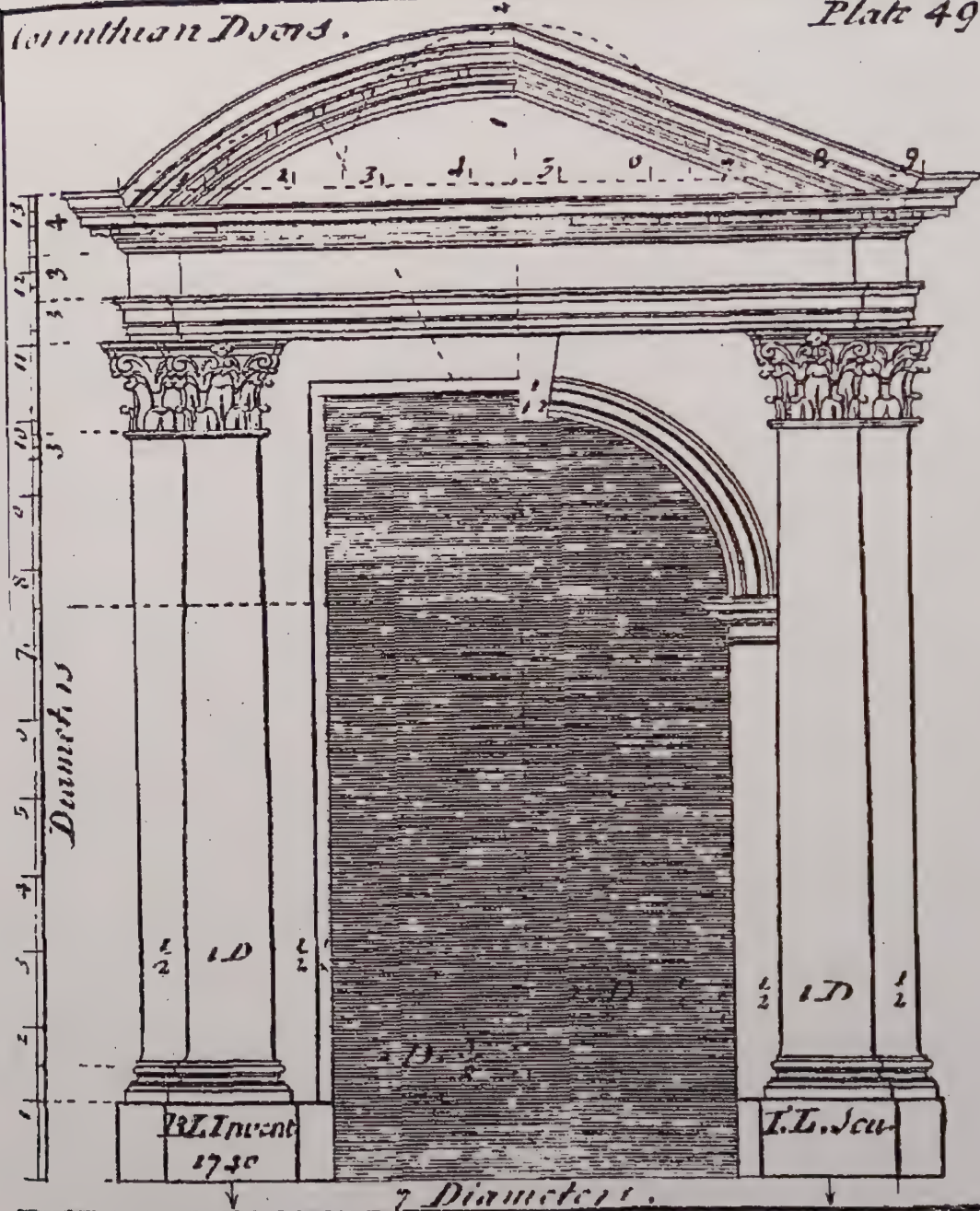
Plate 49

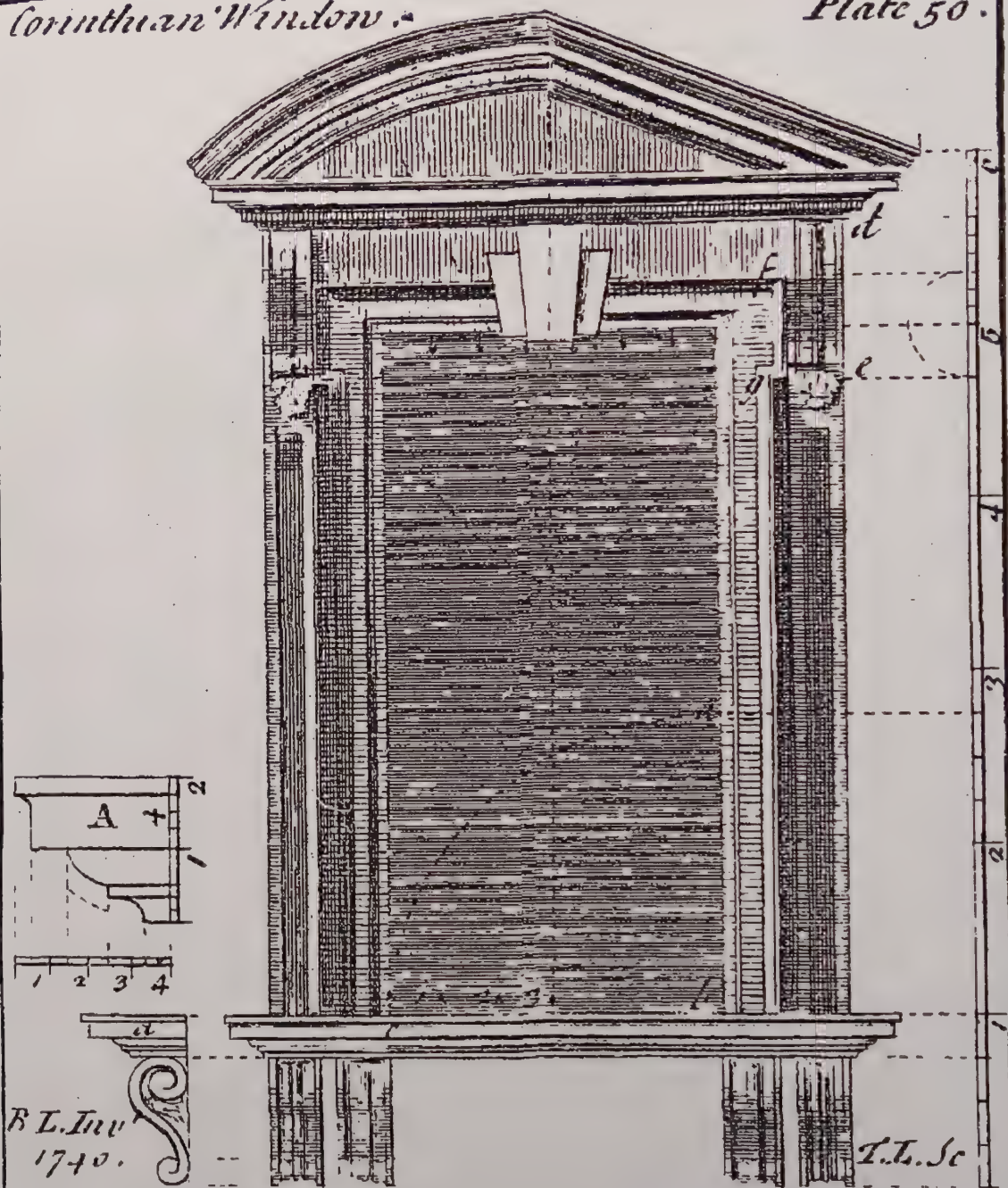


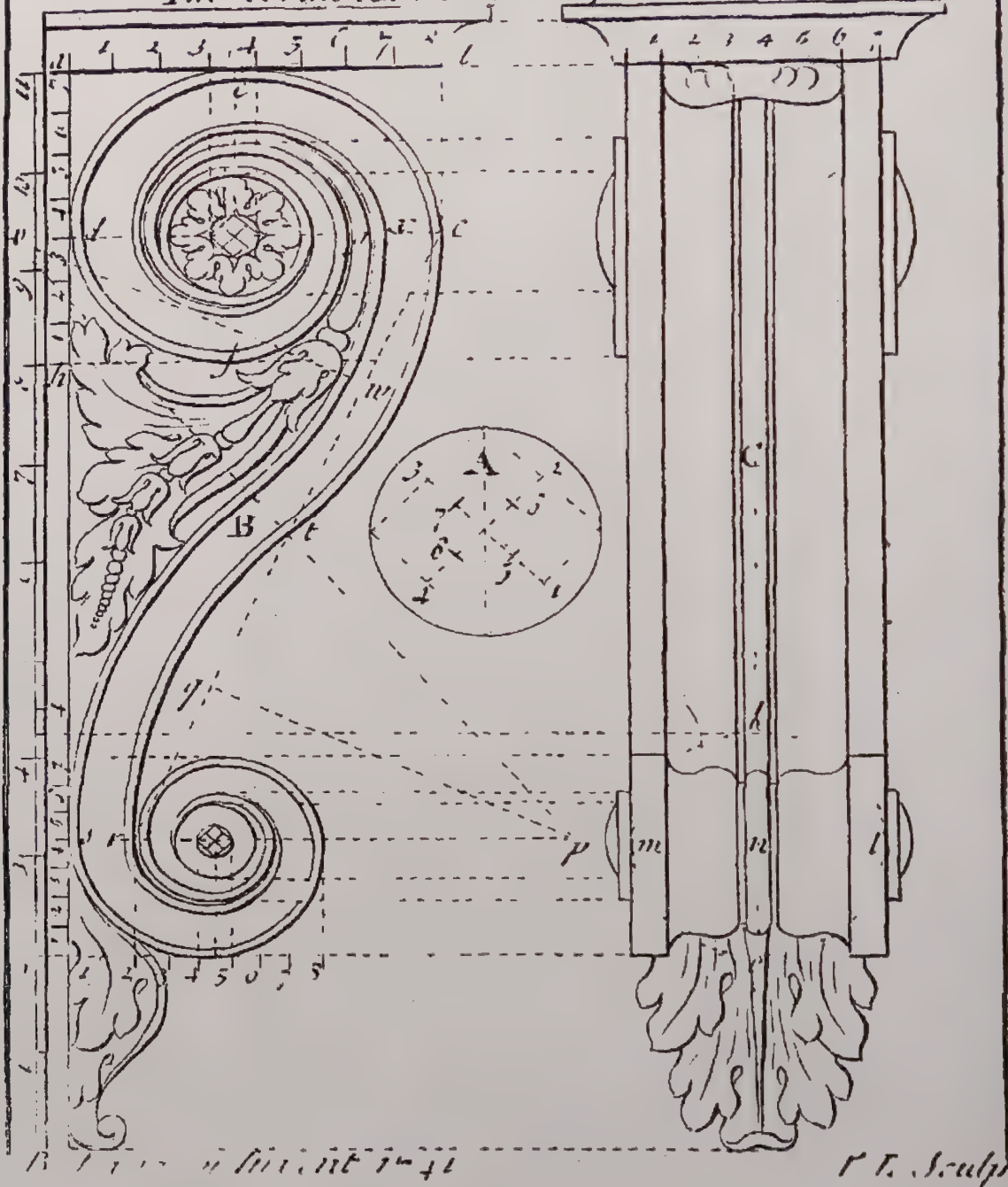


Corinthian Doors.

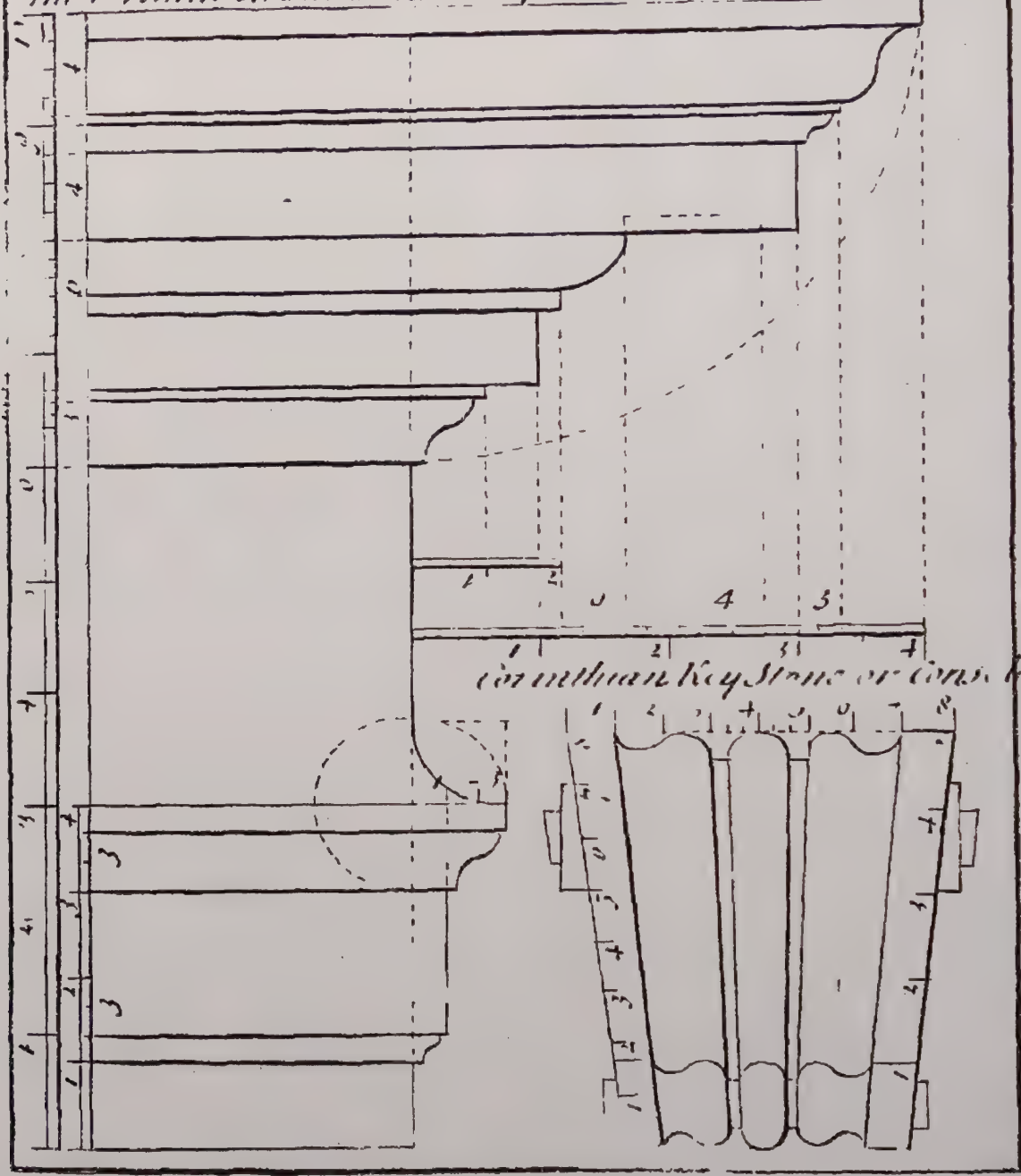
Plate 49.







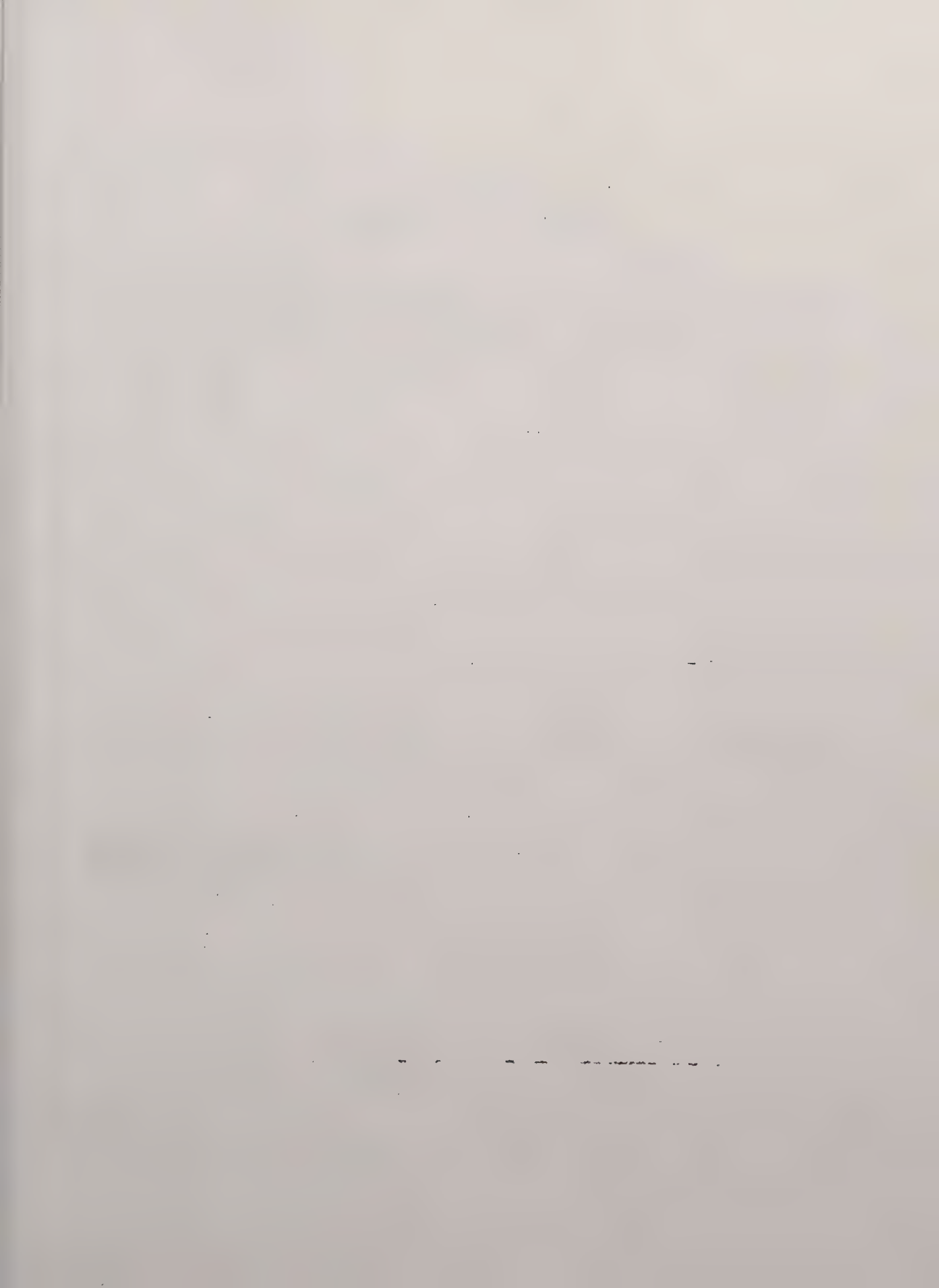
The Corinthian Entablature for Doors Windows &c. Pl. 52



Corinthian Intercolumniation



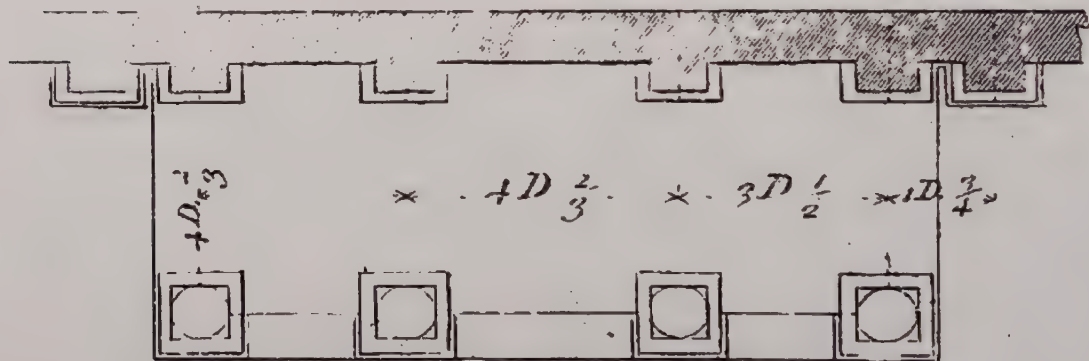
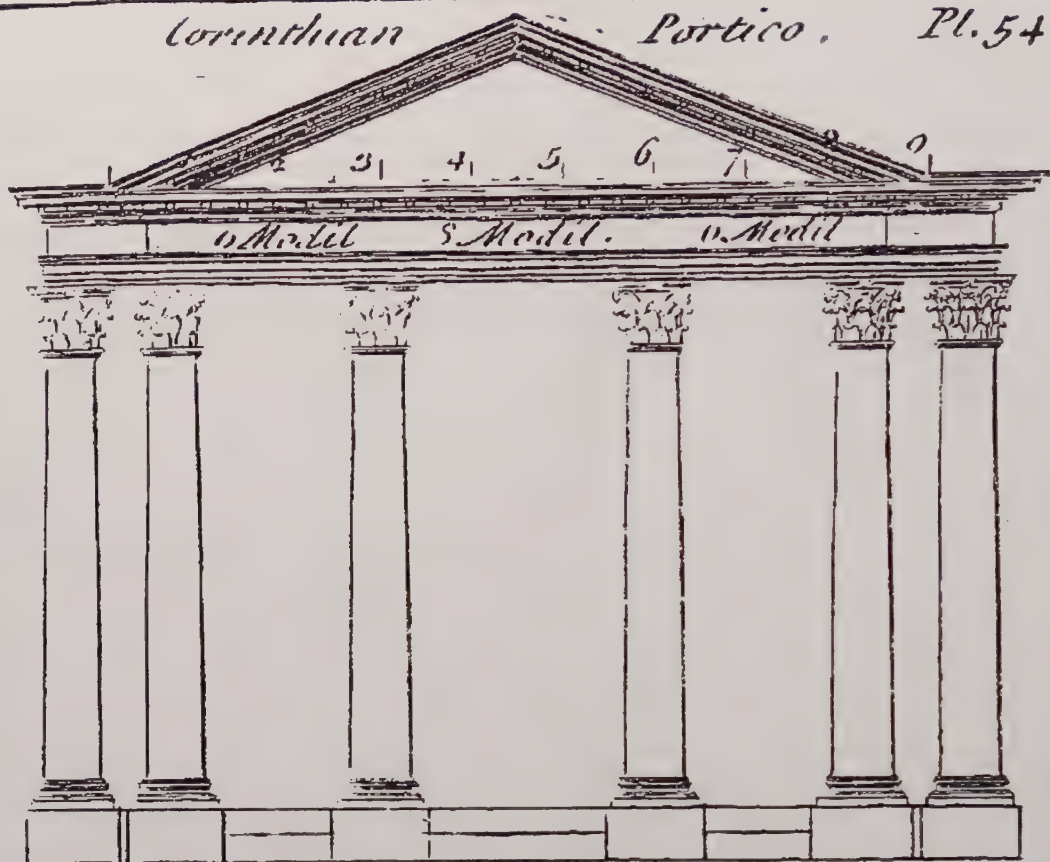
Plate 53



Corinthian

Portico.

Pl. 54.



B. Langley Invent 1740

T. L. Sculp

14. Modifications.

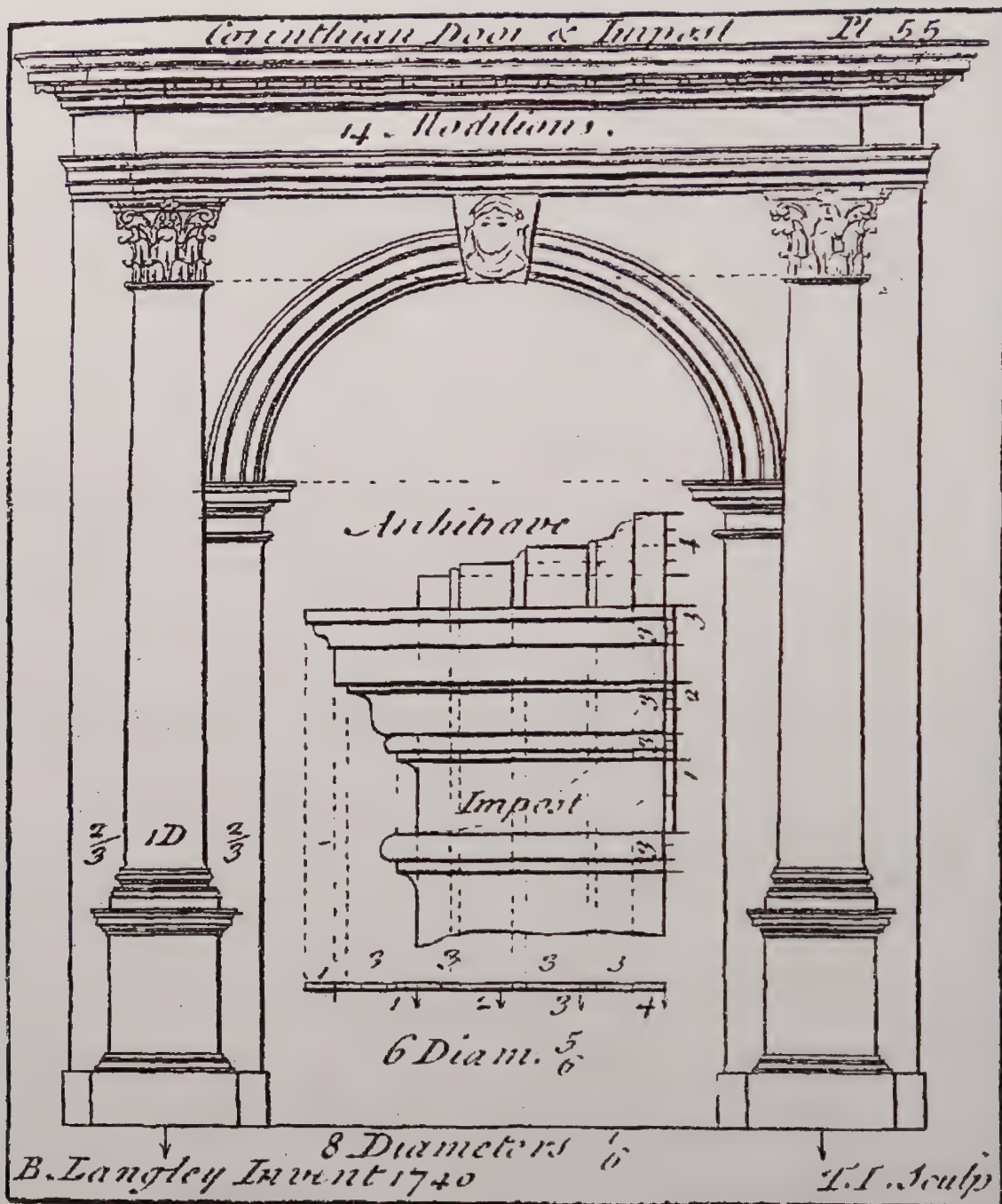
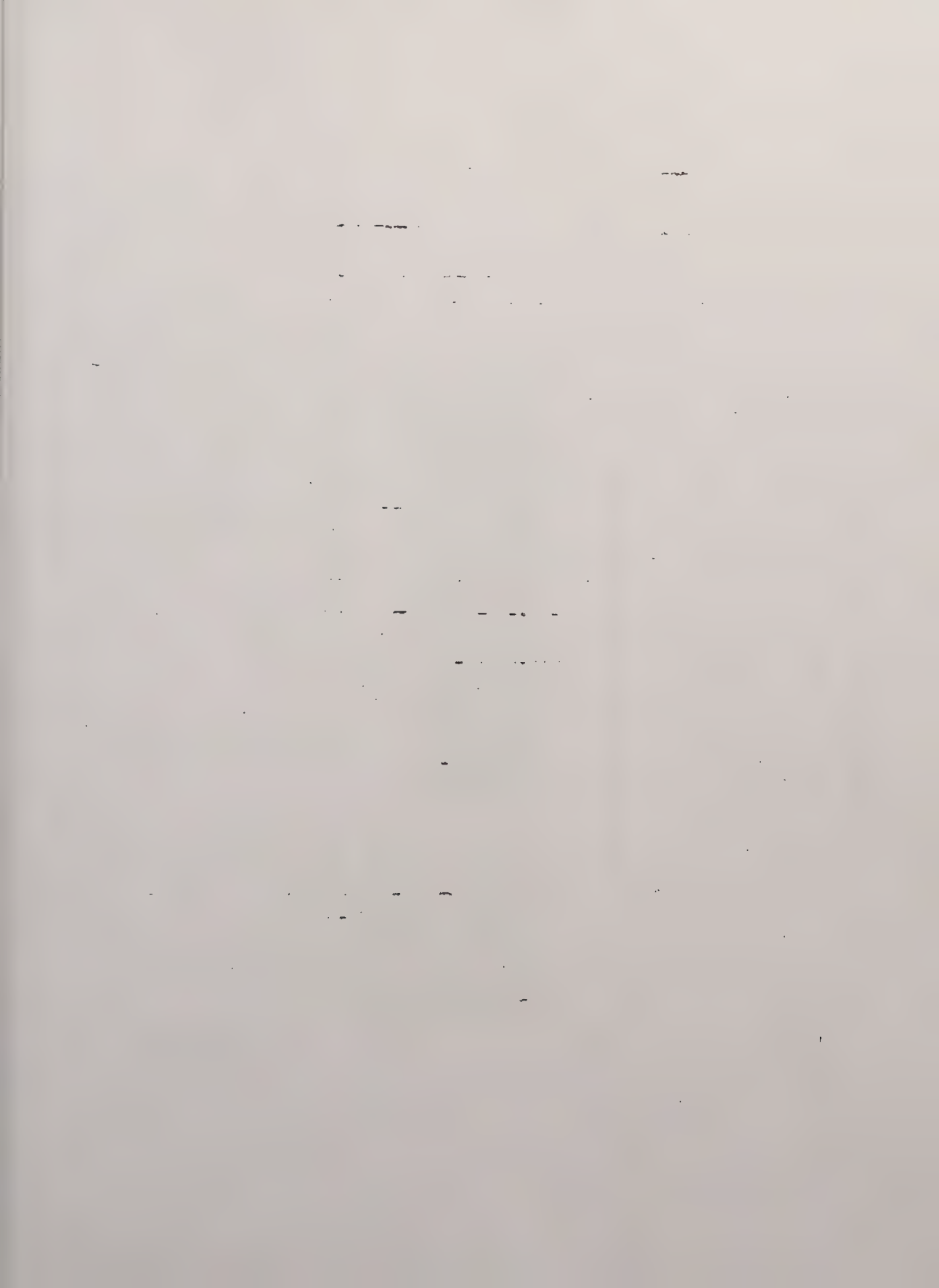
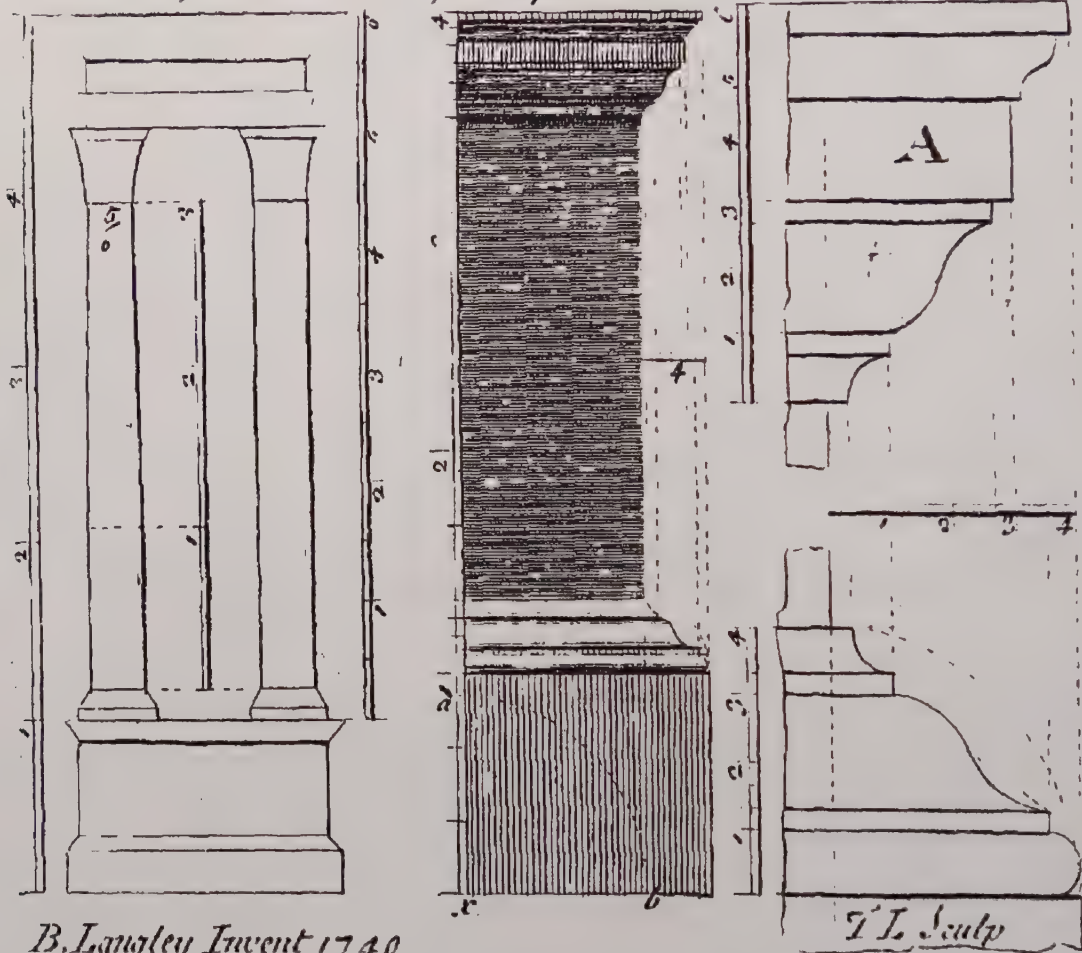




Plate 56.



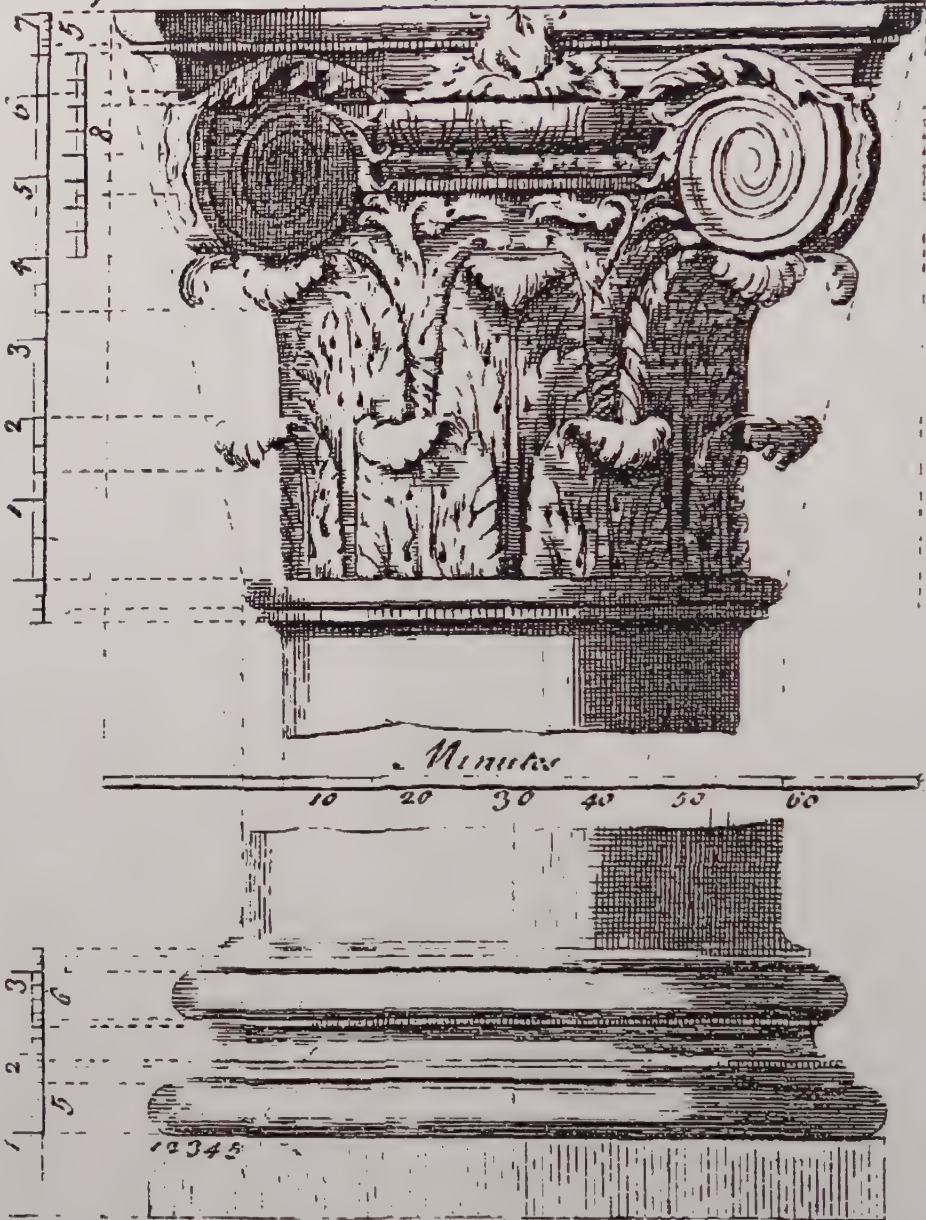
An elevation of the General Parts of the Composite Order with the Pedestal at large.



B. Langley Invent 1740

T.L. Sculp

The Composite Base & Capital to a Column Pl 58.

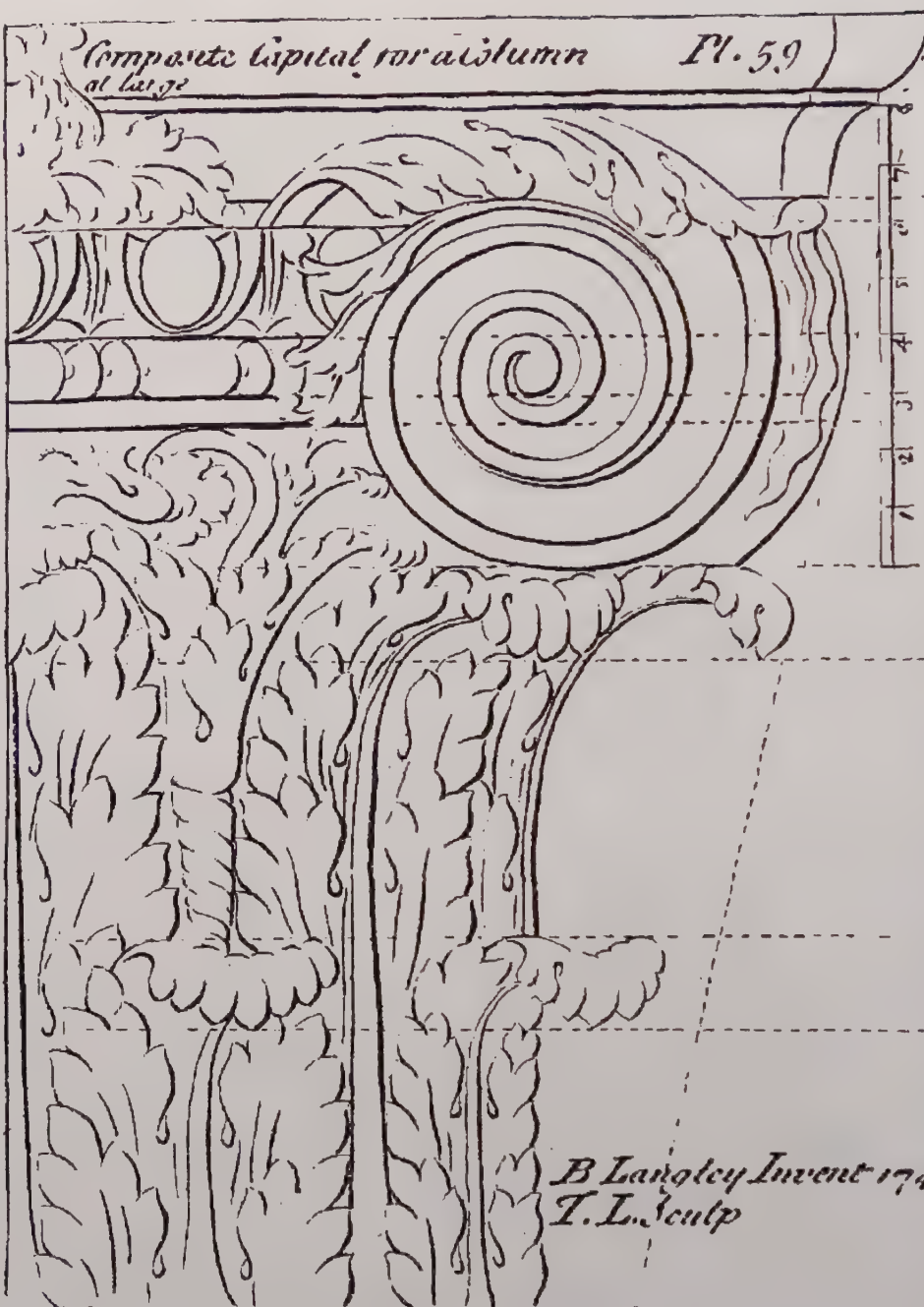


L. E. Trenchard Invent 1740

T.L. Sculp

*Composite Capital for a Column
at large*

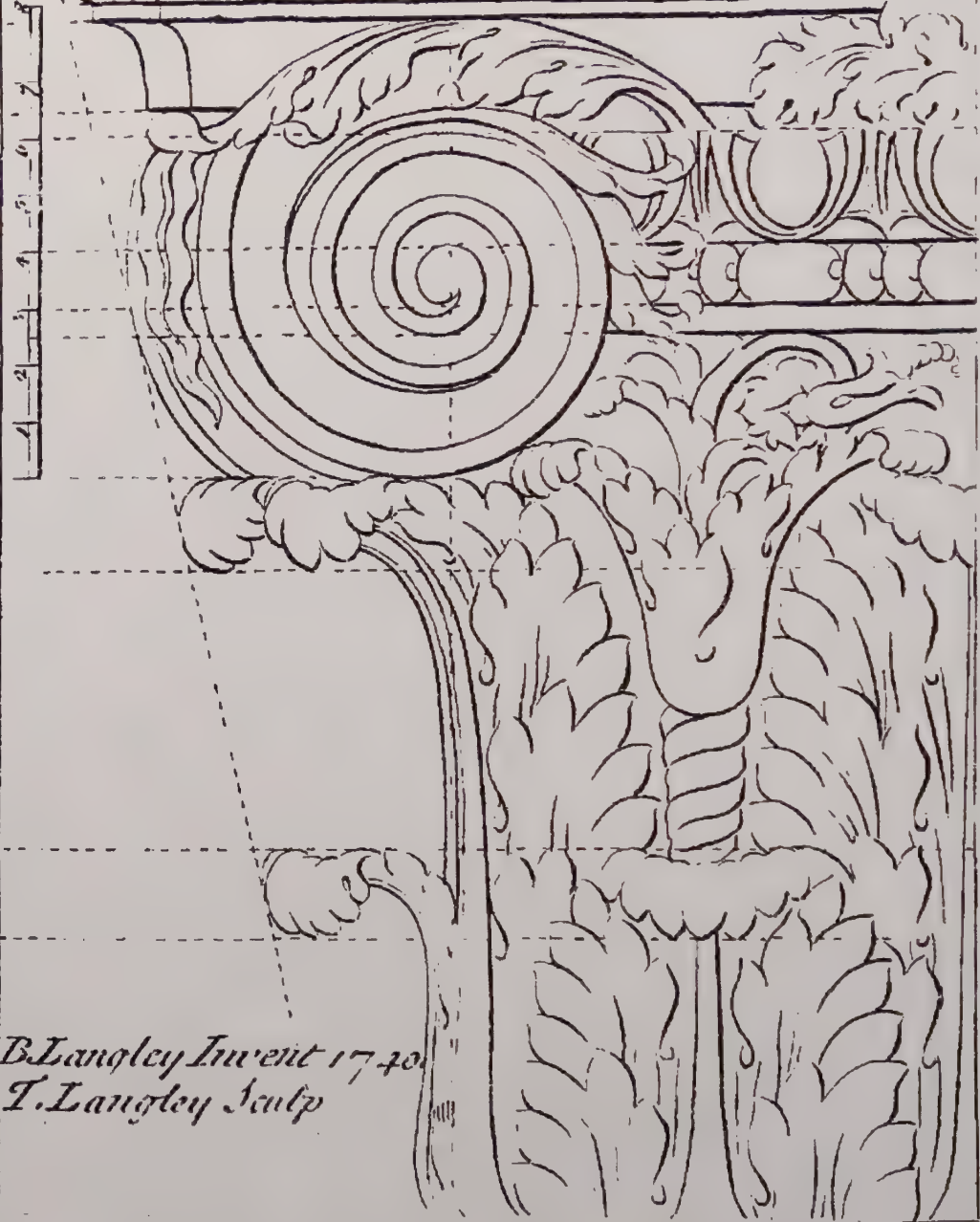
Pl. 59



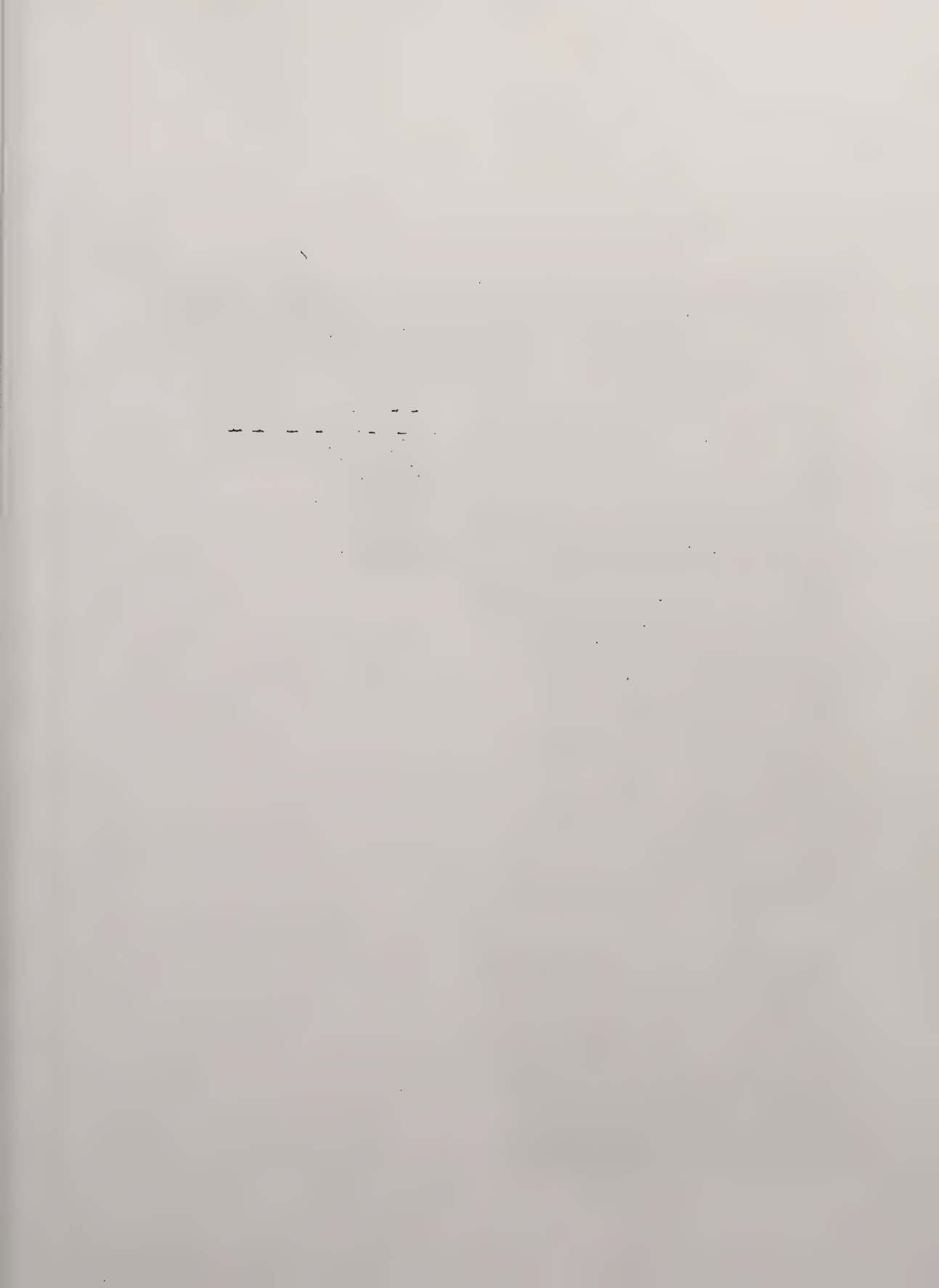
*B Langley Invent 1740
T. L. Sculp*

*Composite Capital for a Pilaster
at large*

Pl. 60

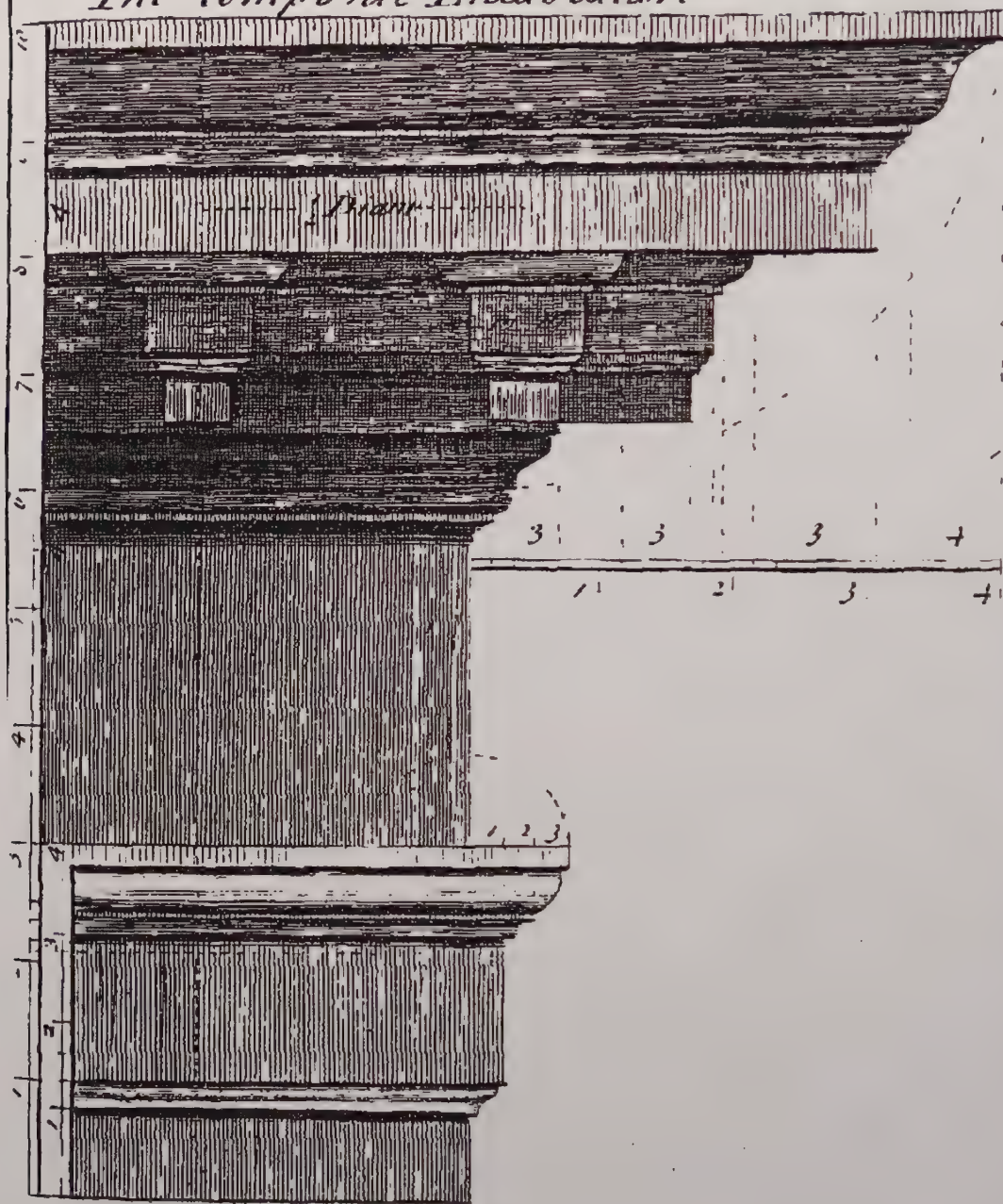


*B. Langley Invent 1740
T. Langley Sculp*

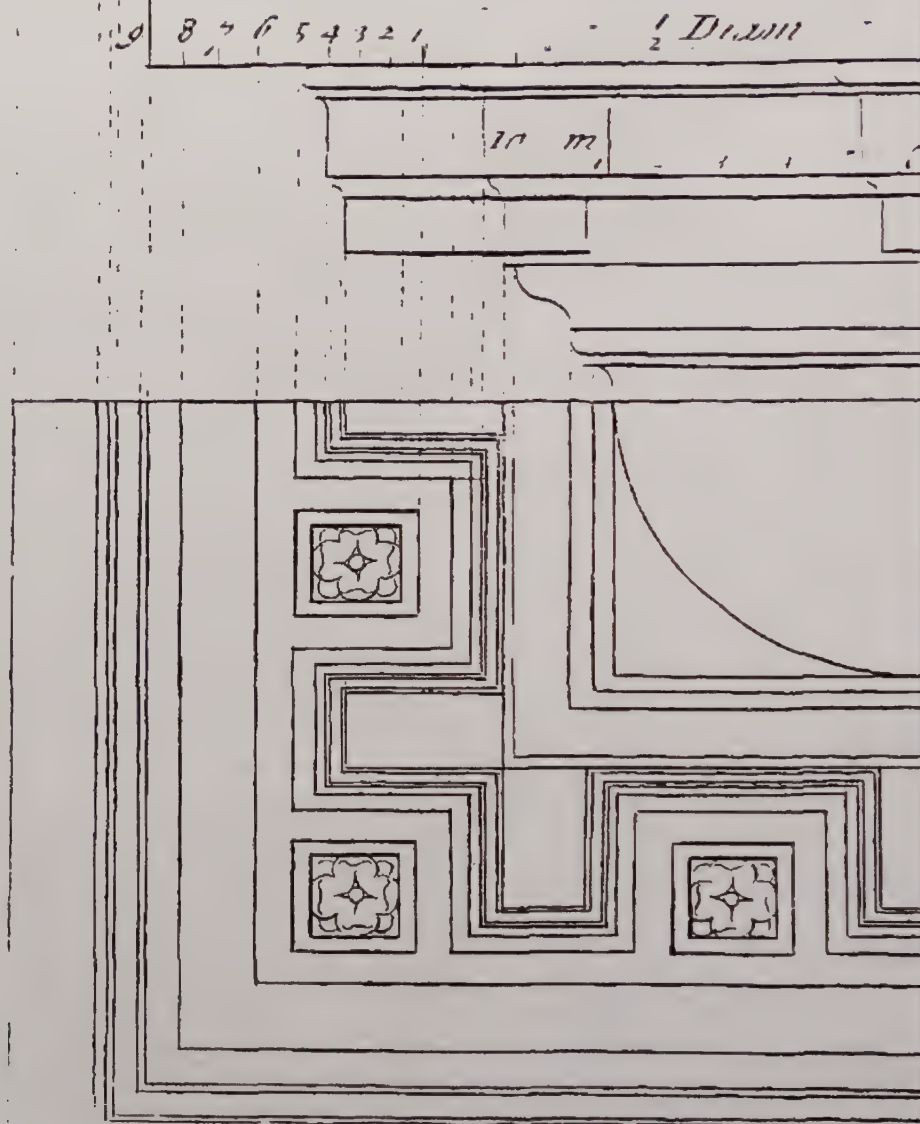


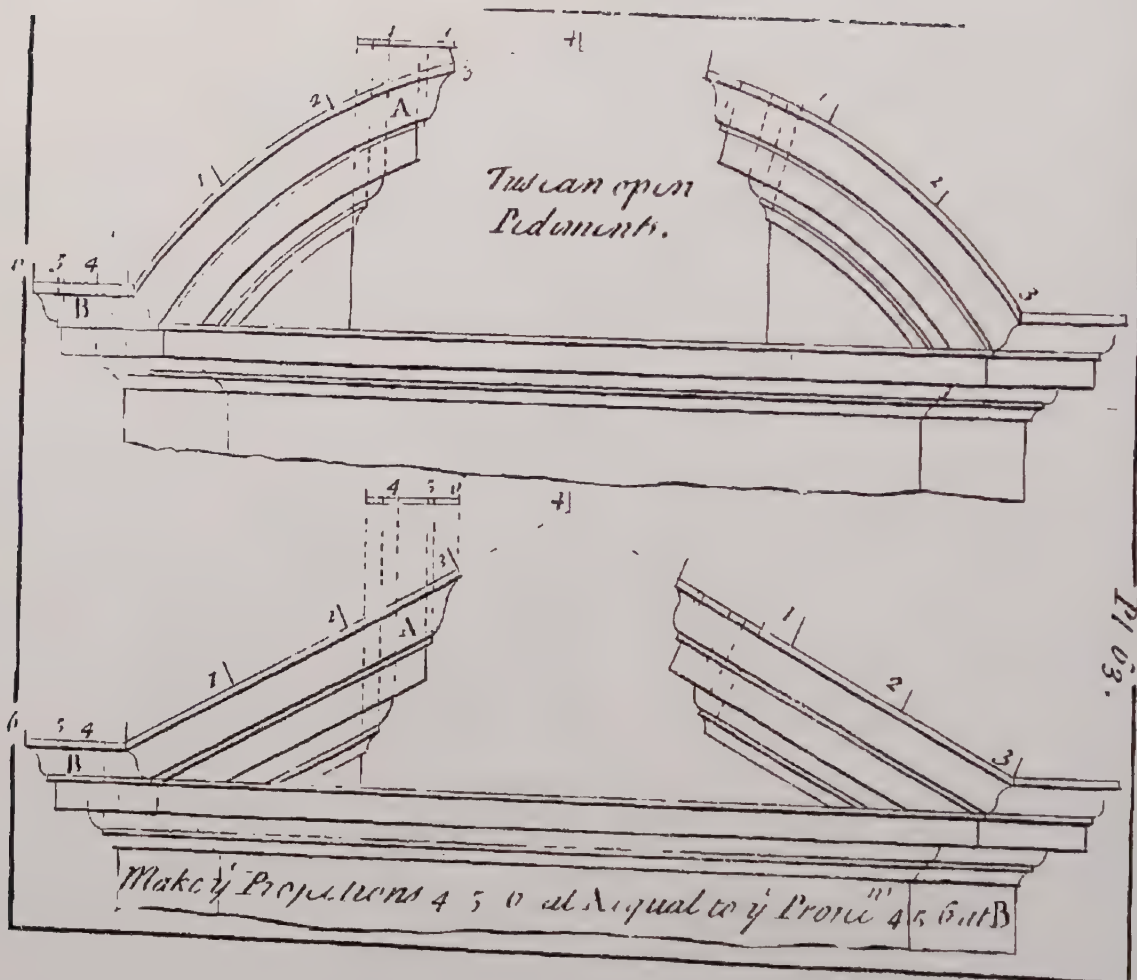
The Composite Entablature

Pl 61

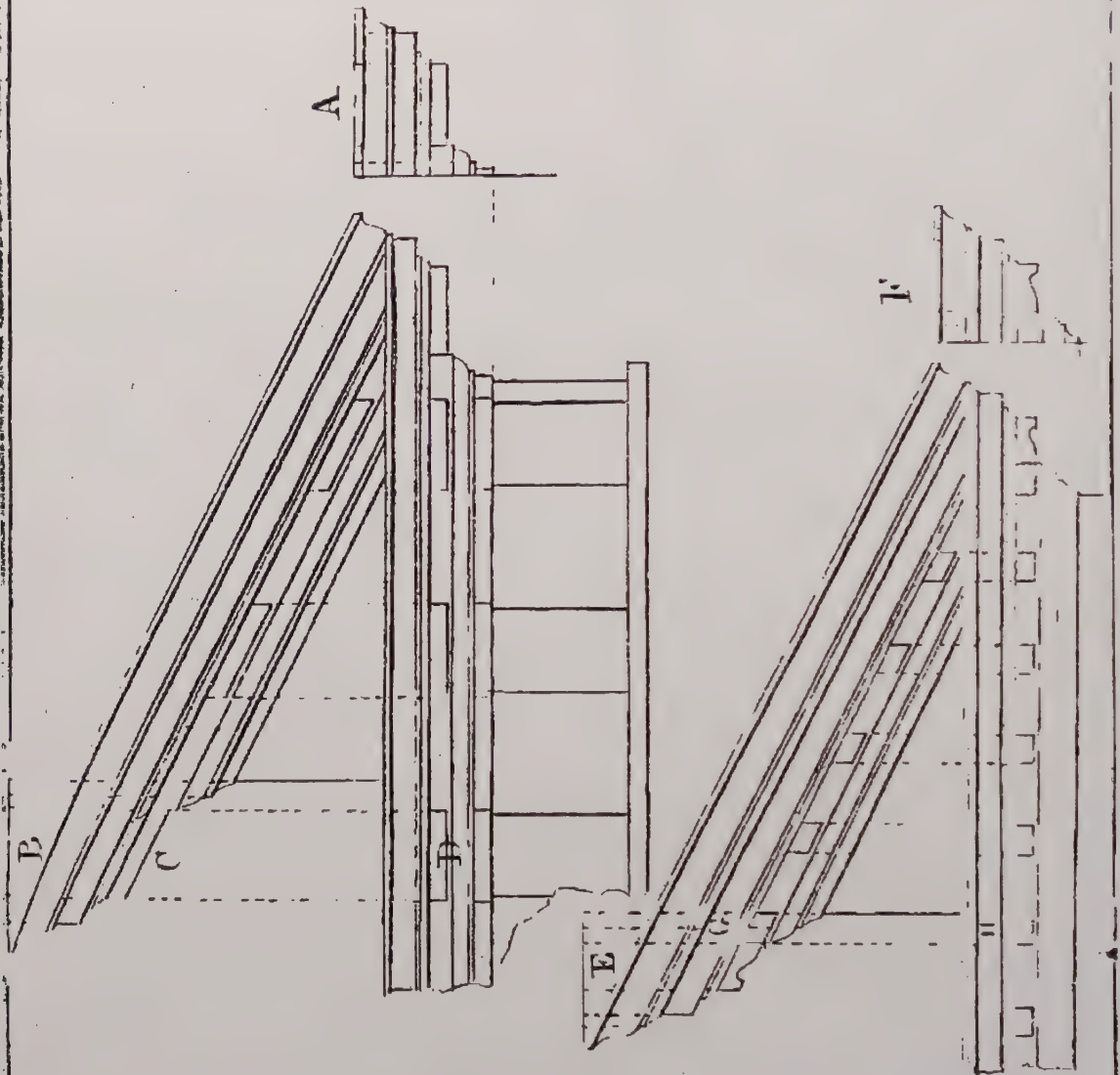


The Planter of the Composite Column



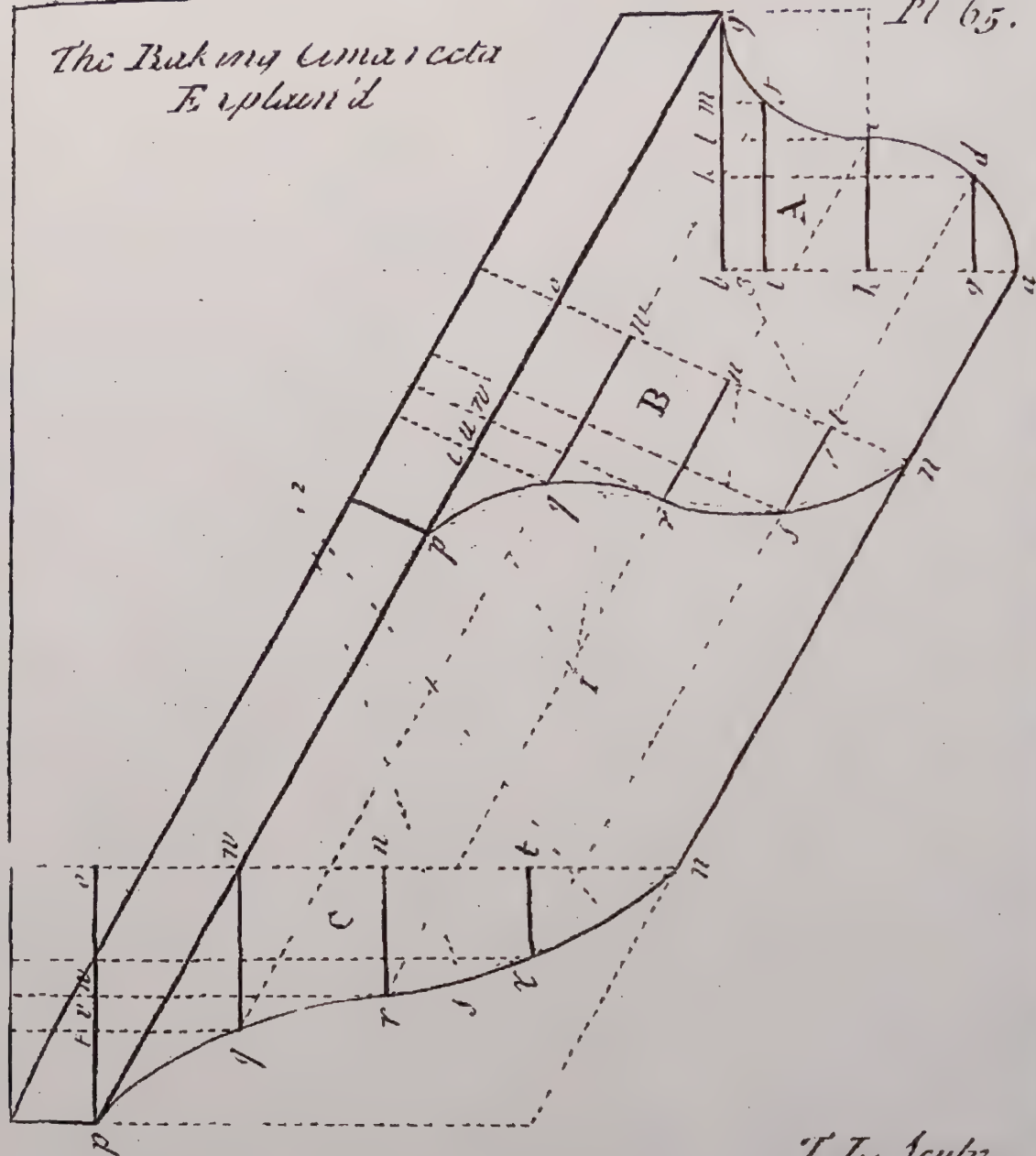


The Dorick & Ionick open Pediment explained



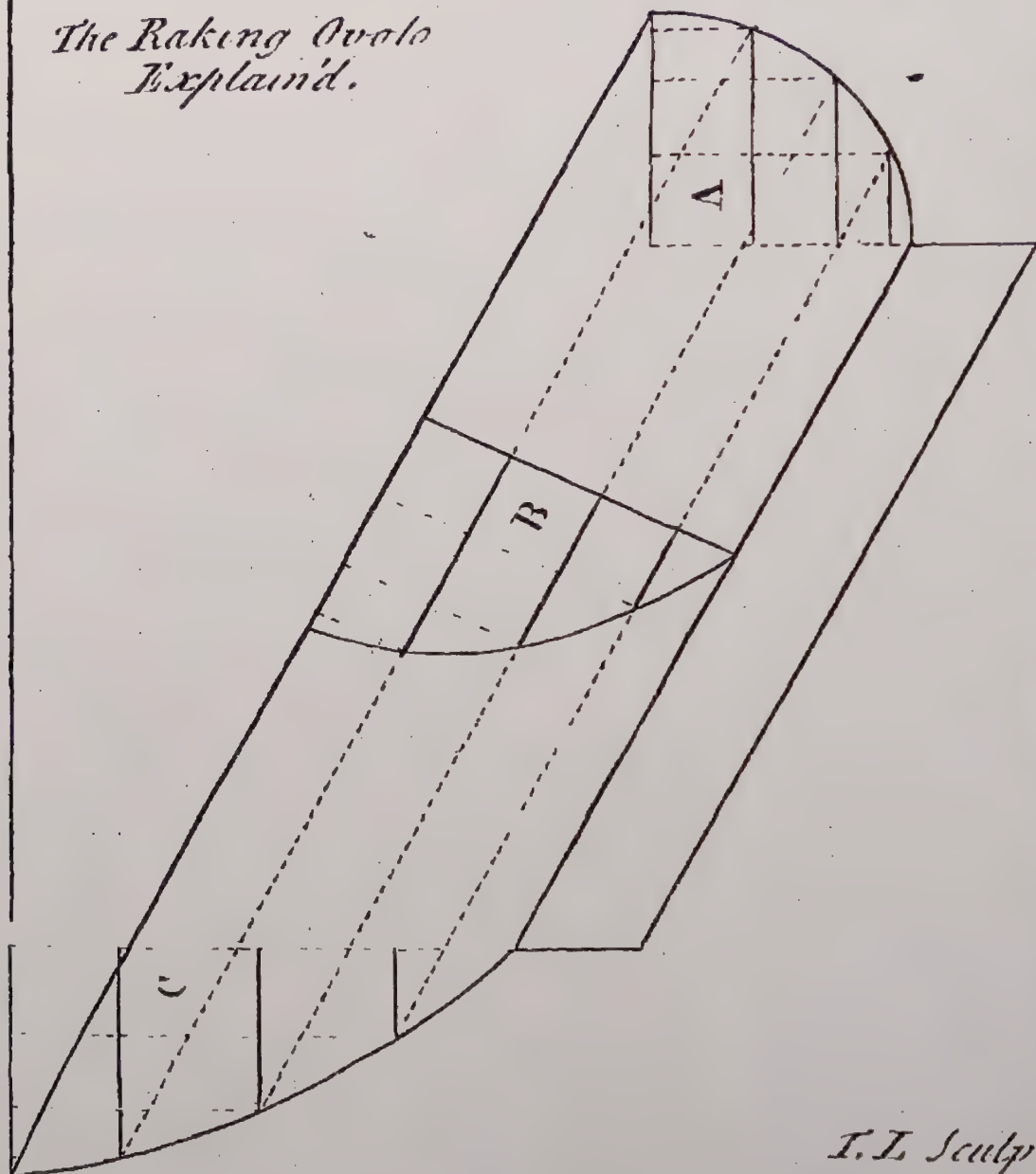
*The Baking Cima recta
Explained*

Pl 65.



T. L. Sculz

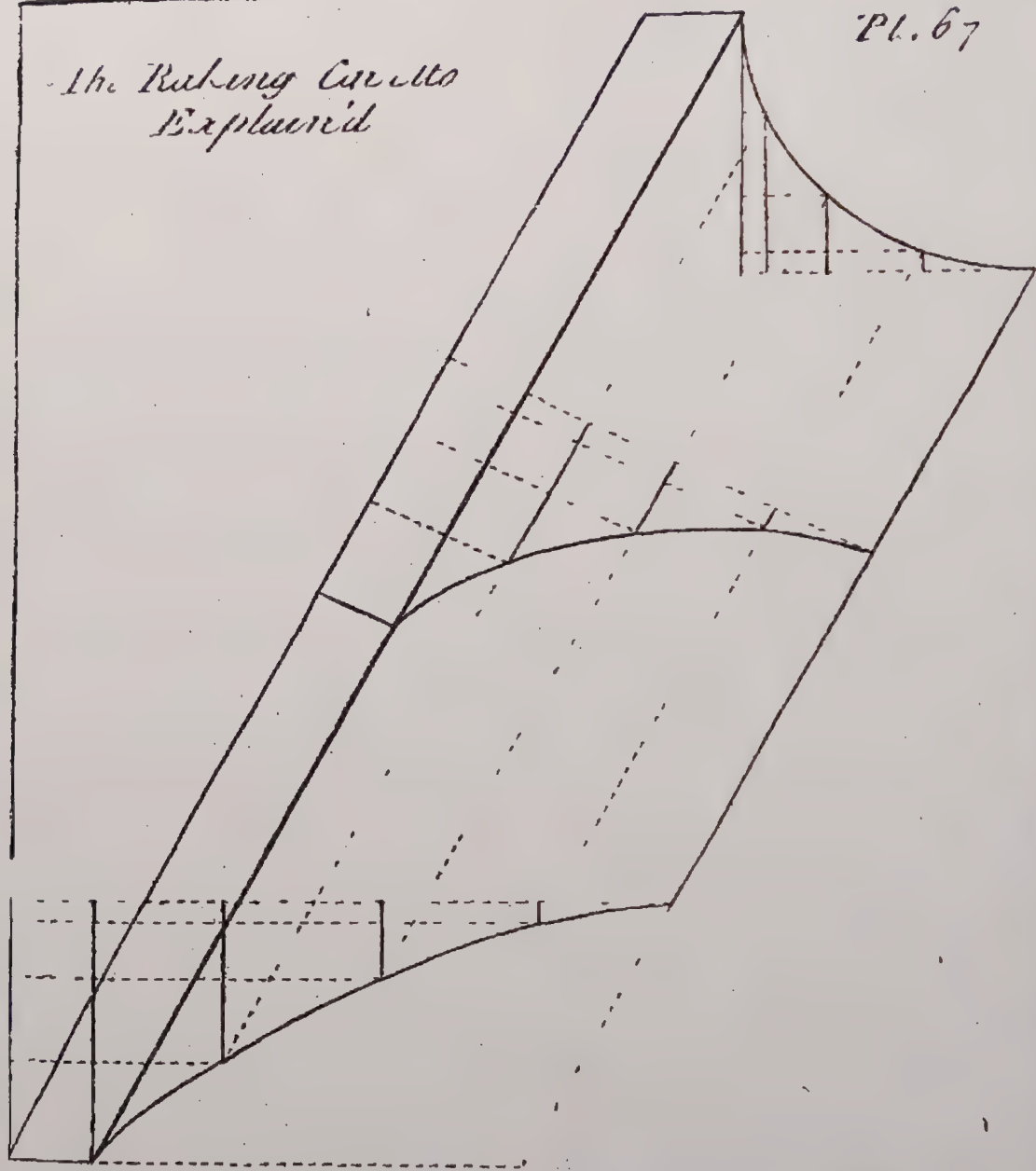
*The Raking Ovolo
Explained.*



J. L. Sculpy

*The Raking Curve
Explained*

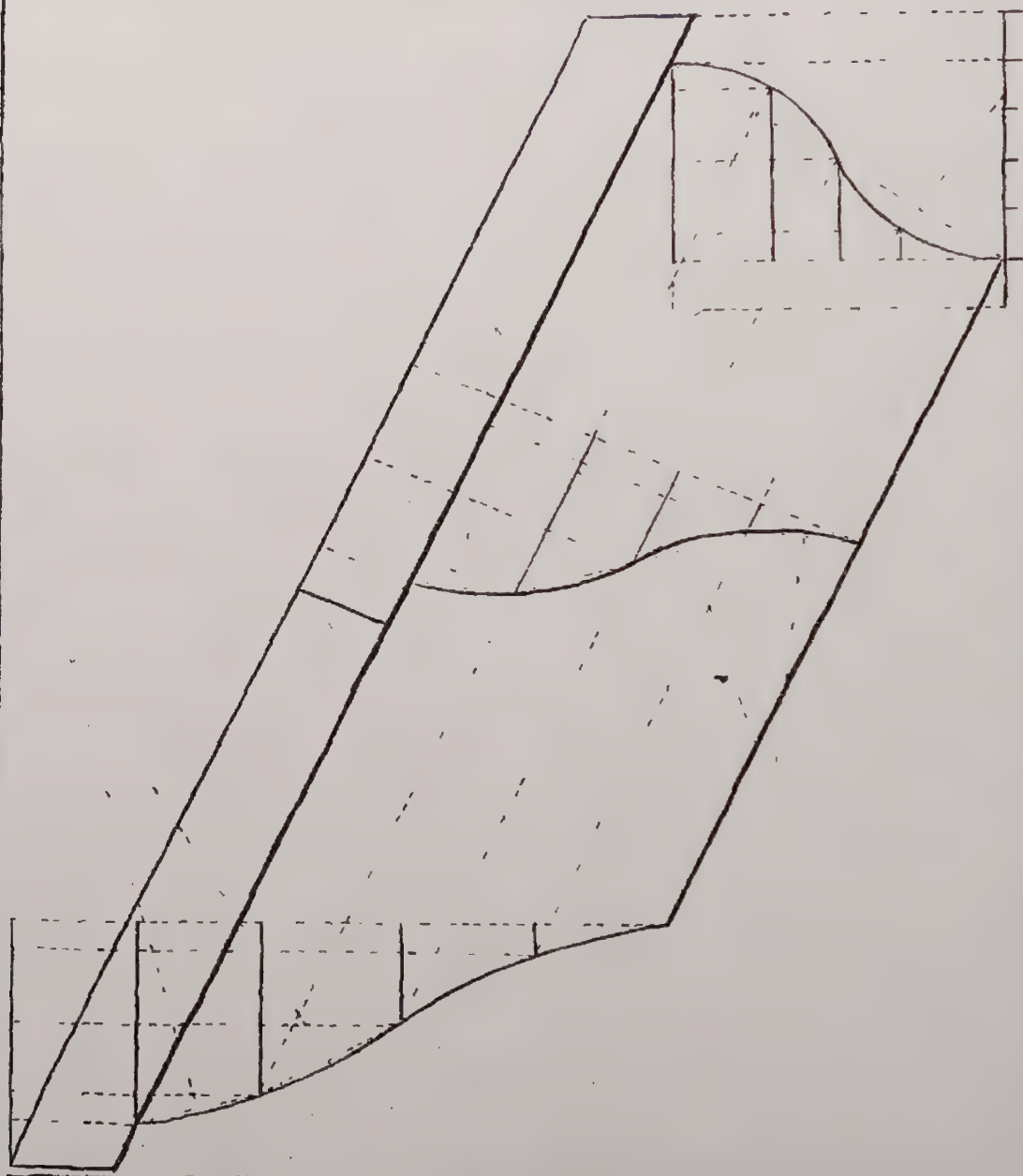
Pl. 67

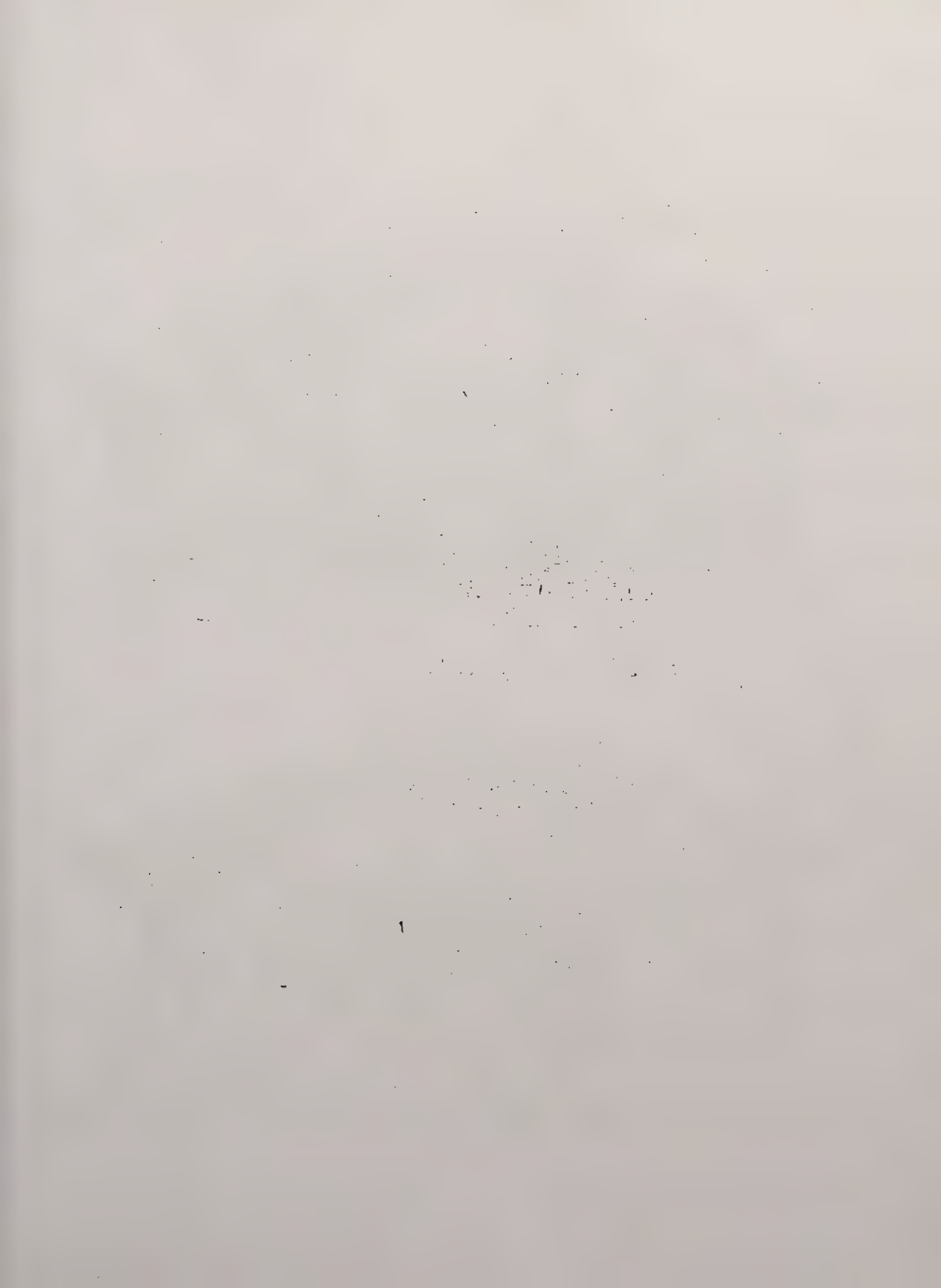


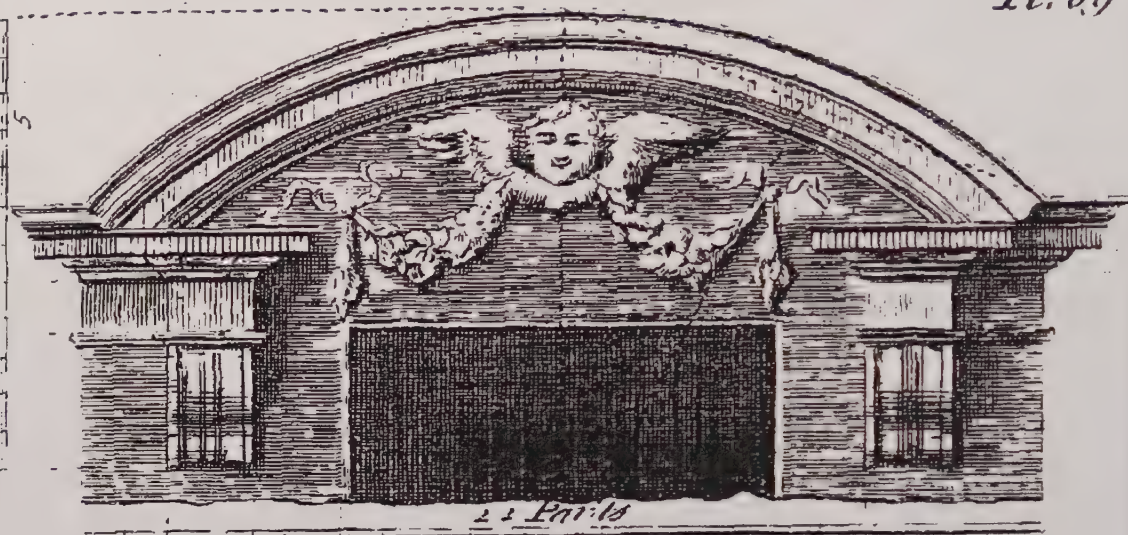
J. L. S. 1871

The Baking Lanna reverse Explained

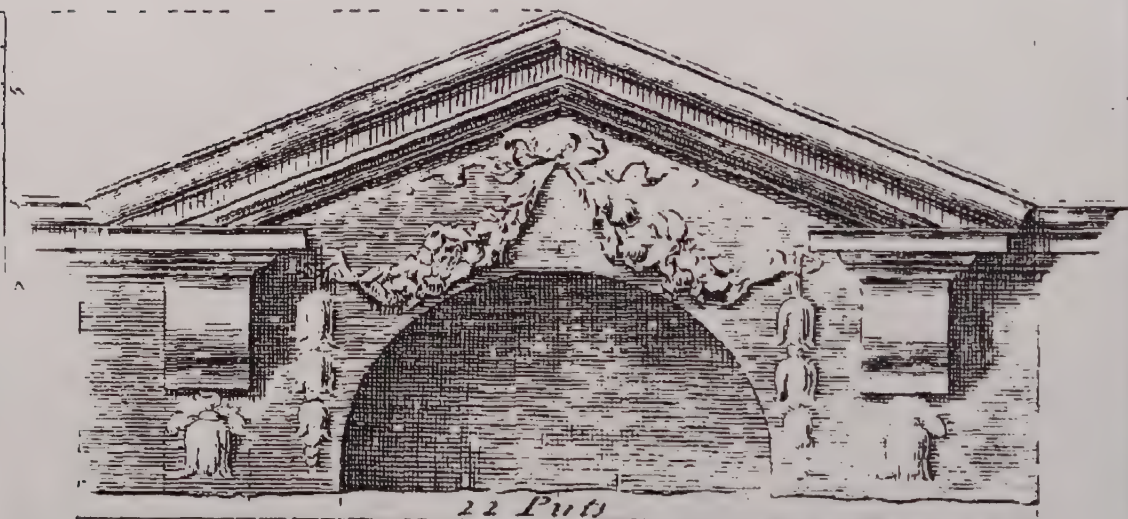
Pl 68





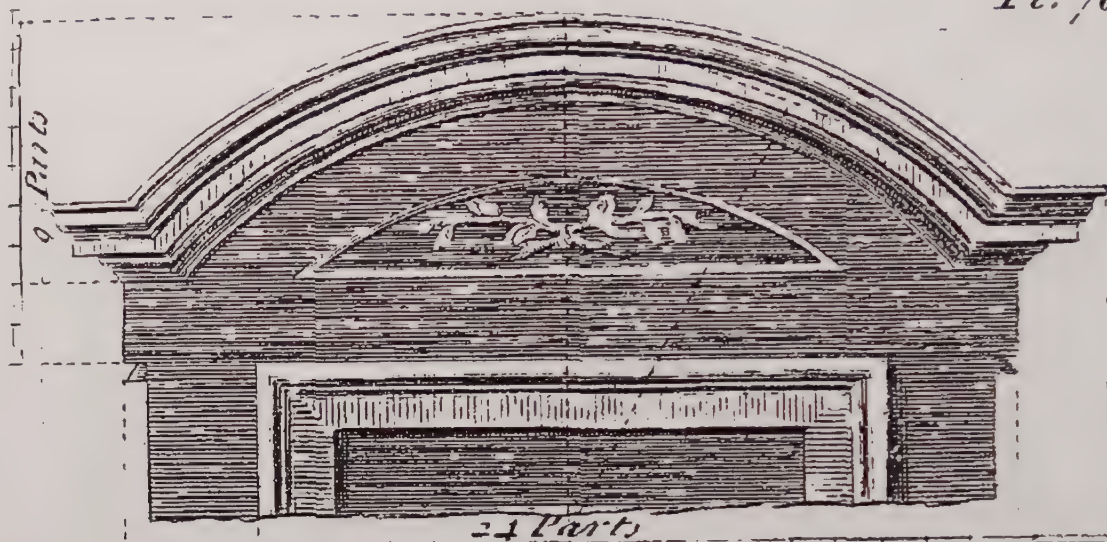


Open Bed mould Tidm^b

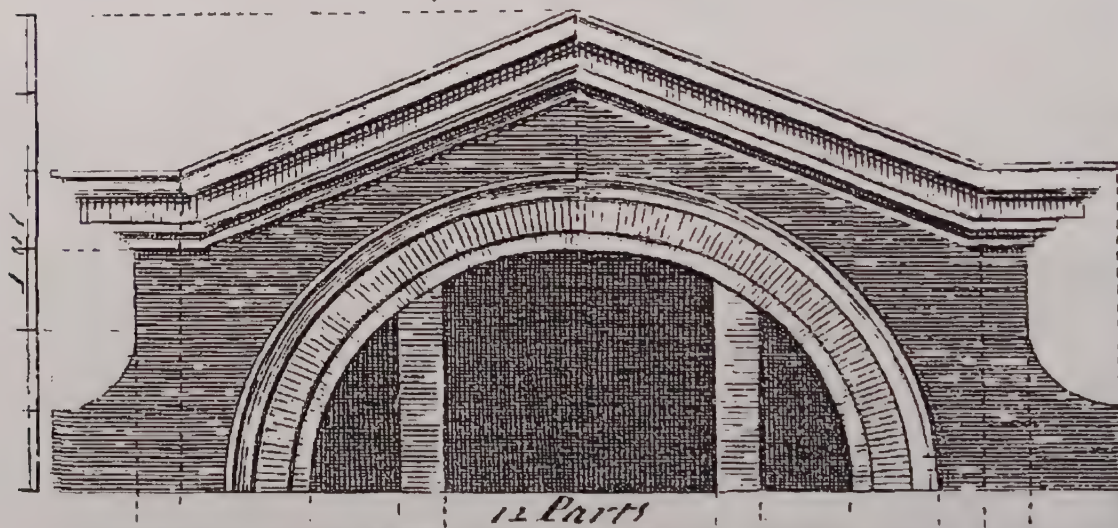


B Langley Invent 1740

T.L. Sculp



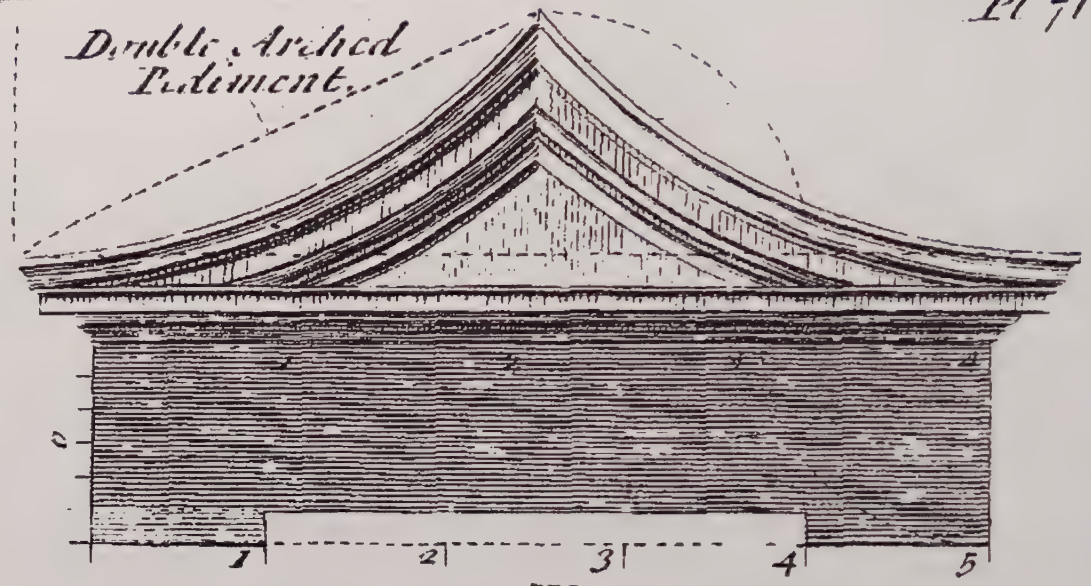
Pediments of continued cornices.



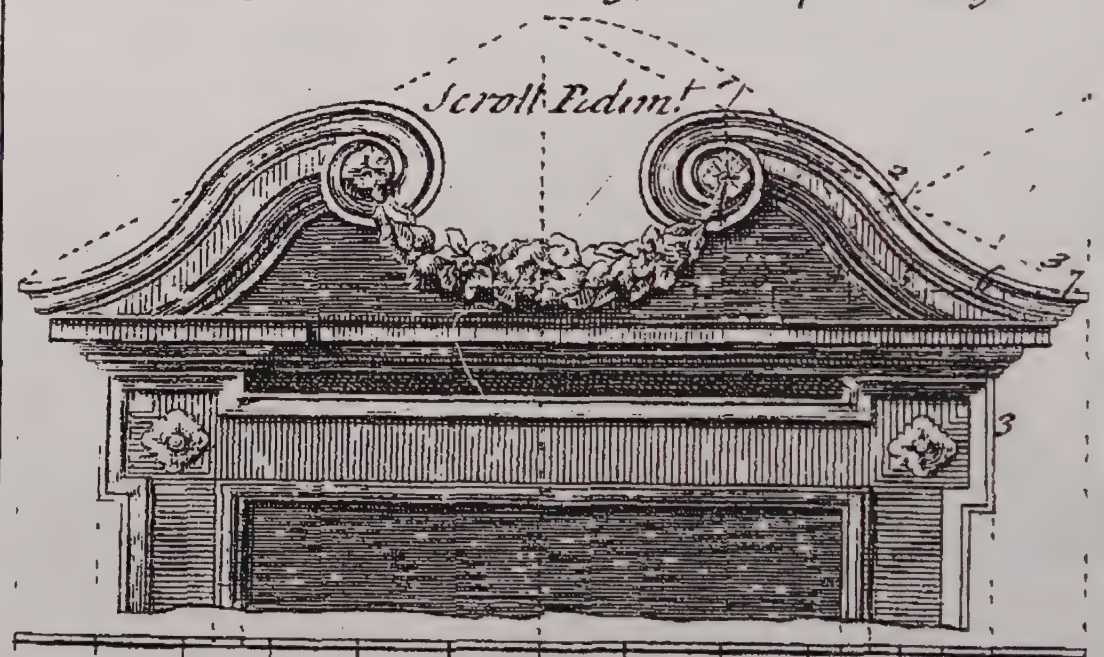
B. Langley Invent 1740.

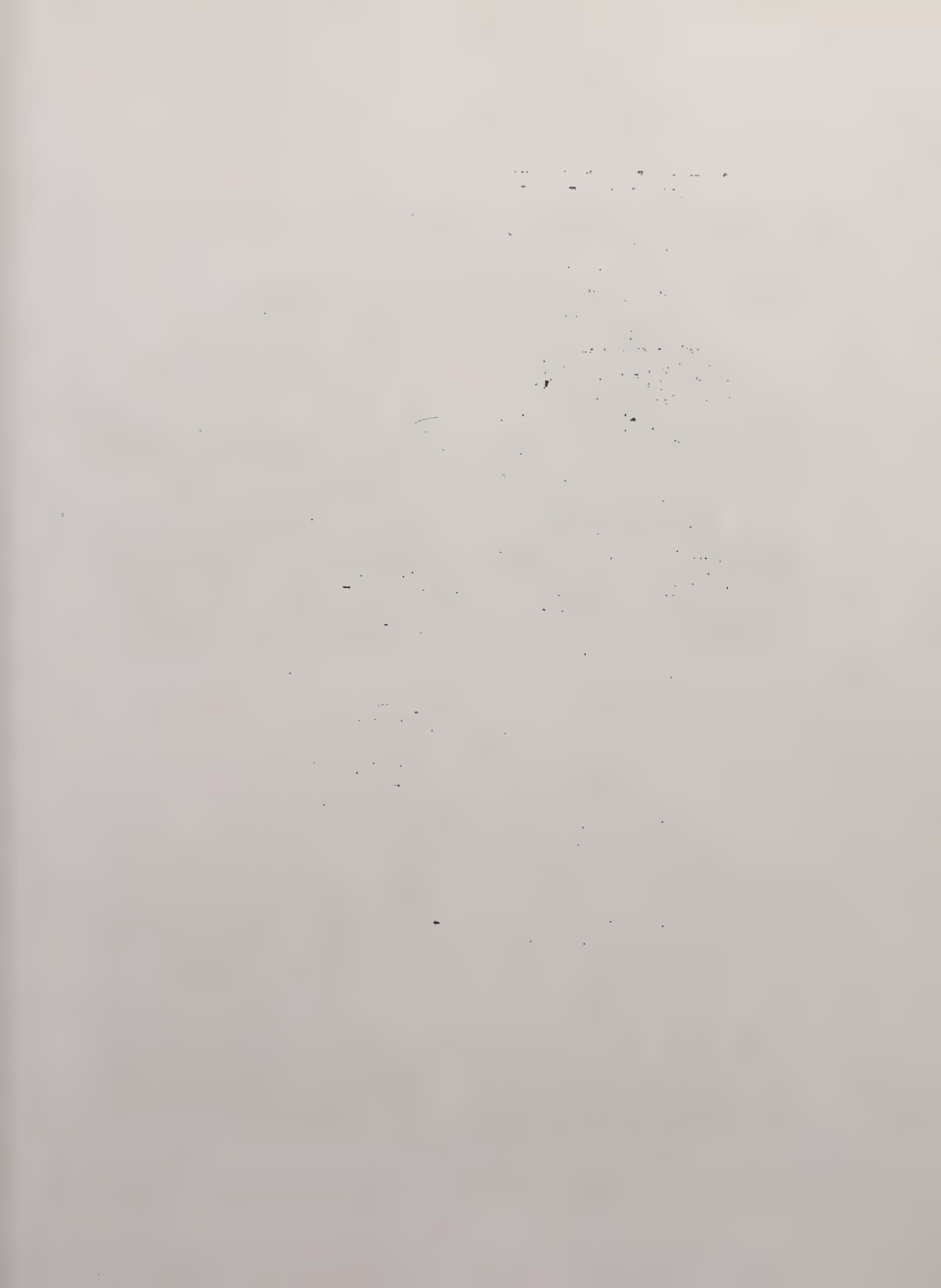
T. L. Sculp.

Double Arched
Pediment.

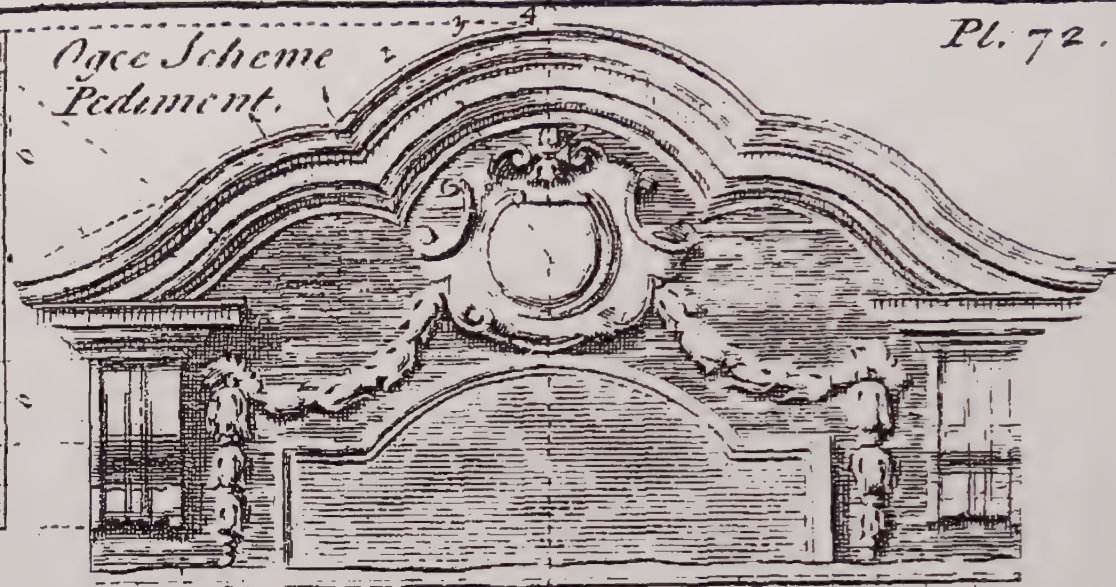


Scroll Pedim^t.



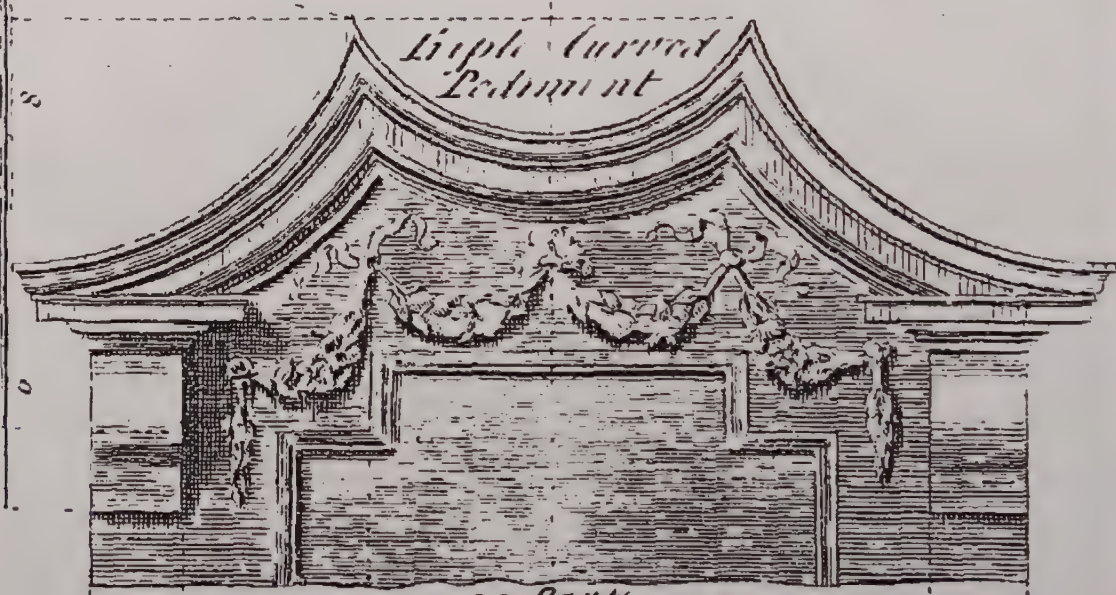


Ogee Scheme
Pediment.

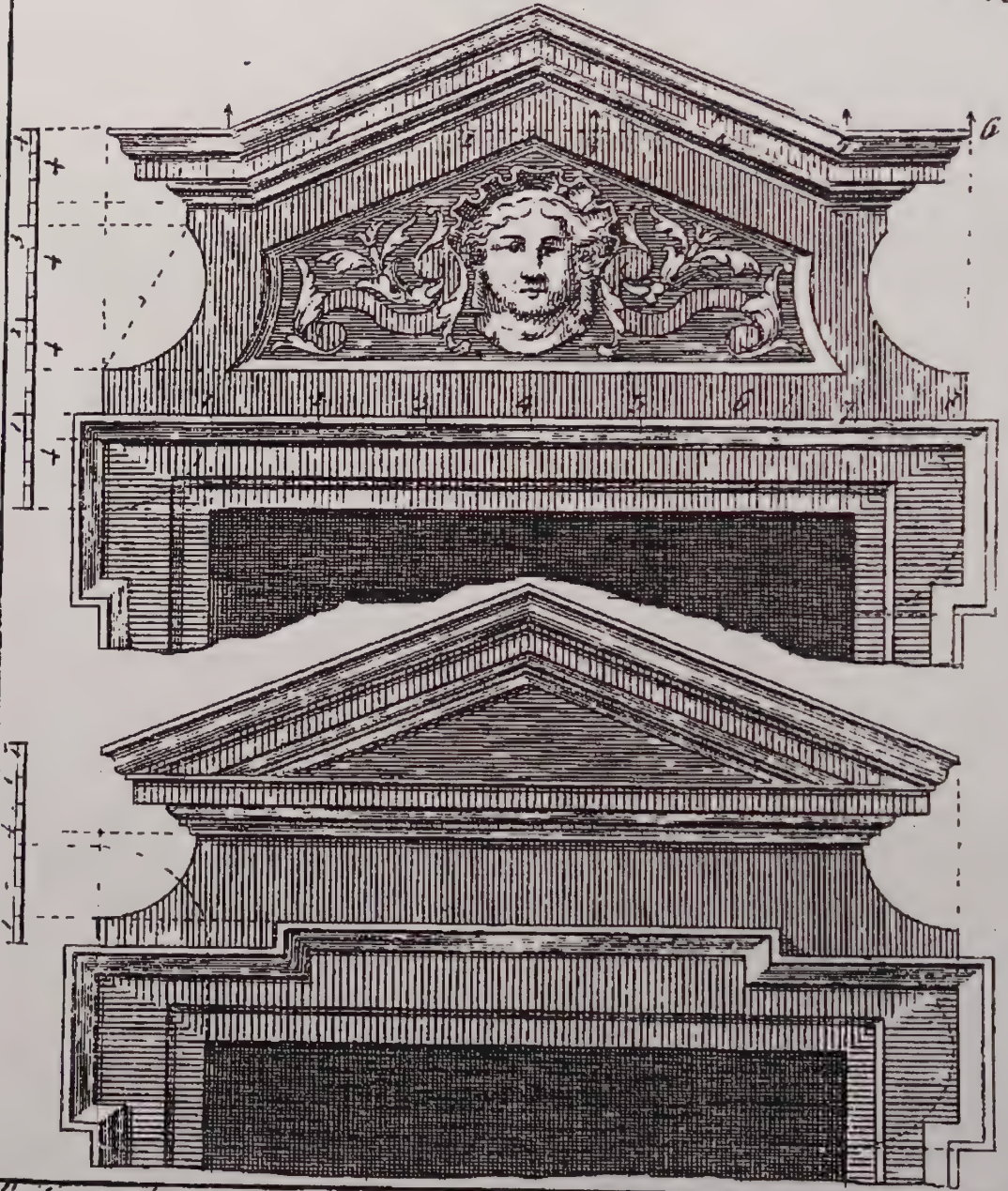


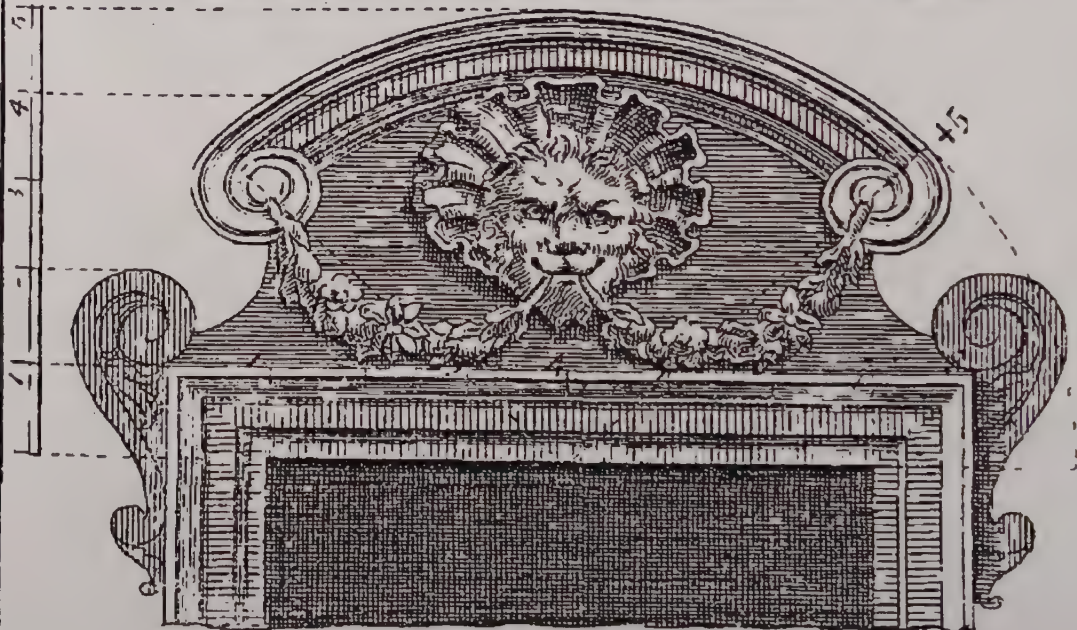
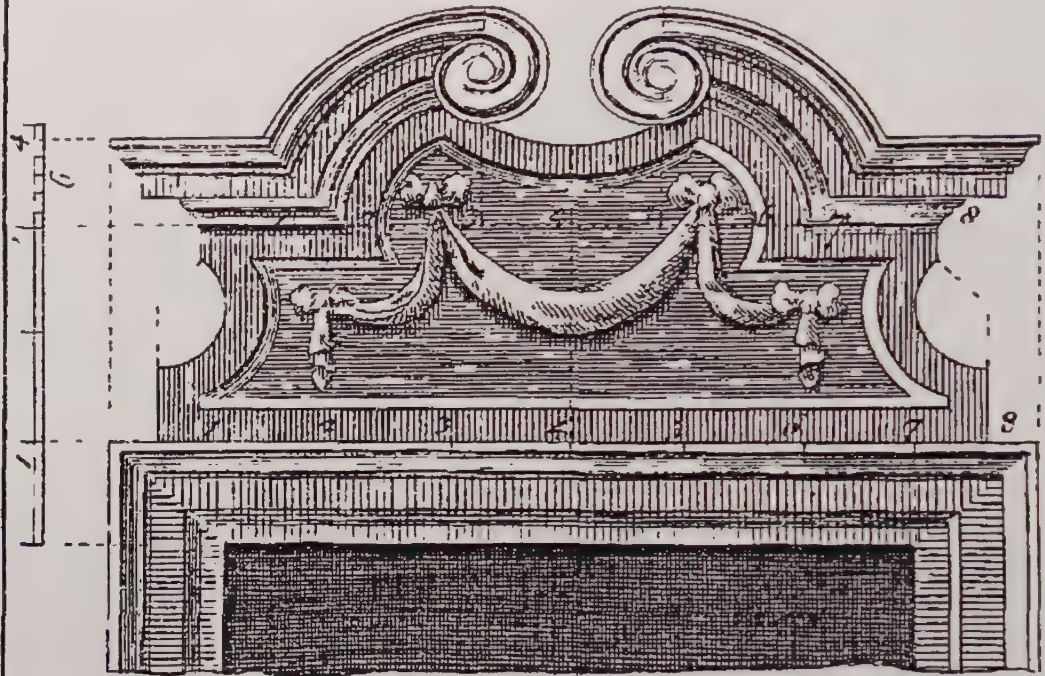
10 Parts

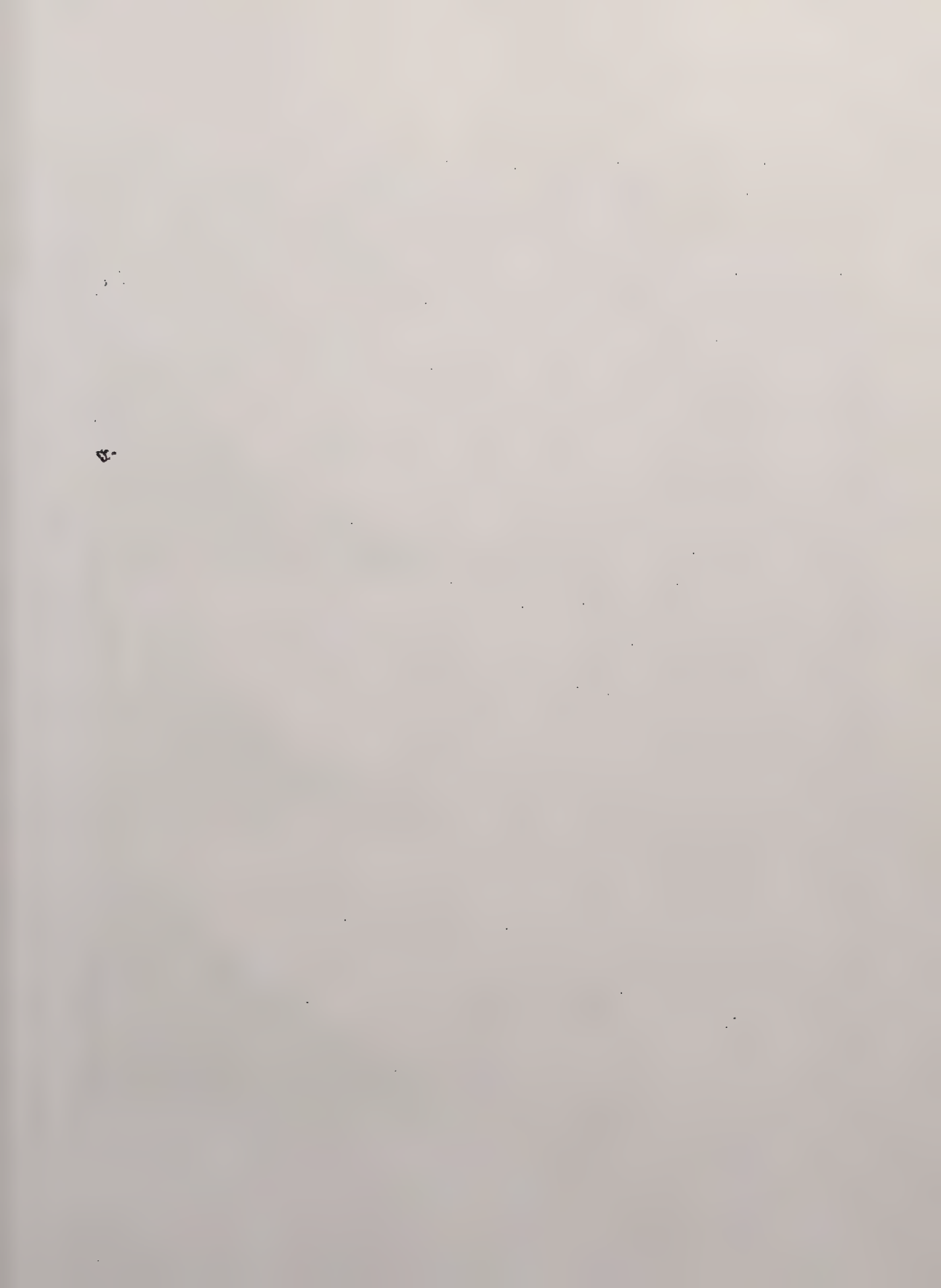
Triple Curved
Pediment



20 Parts

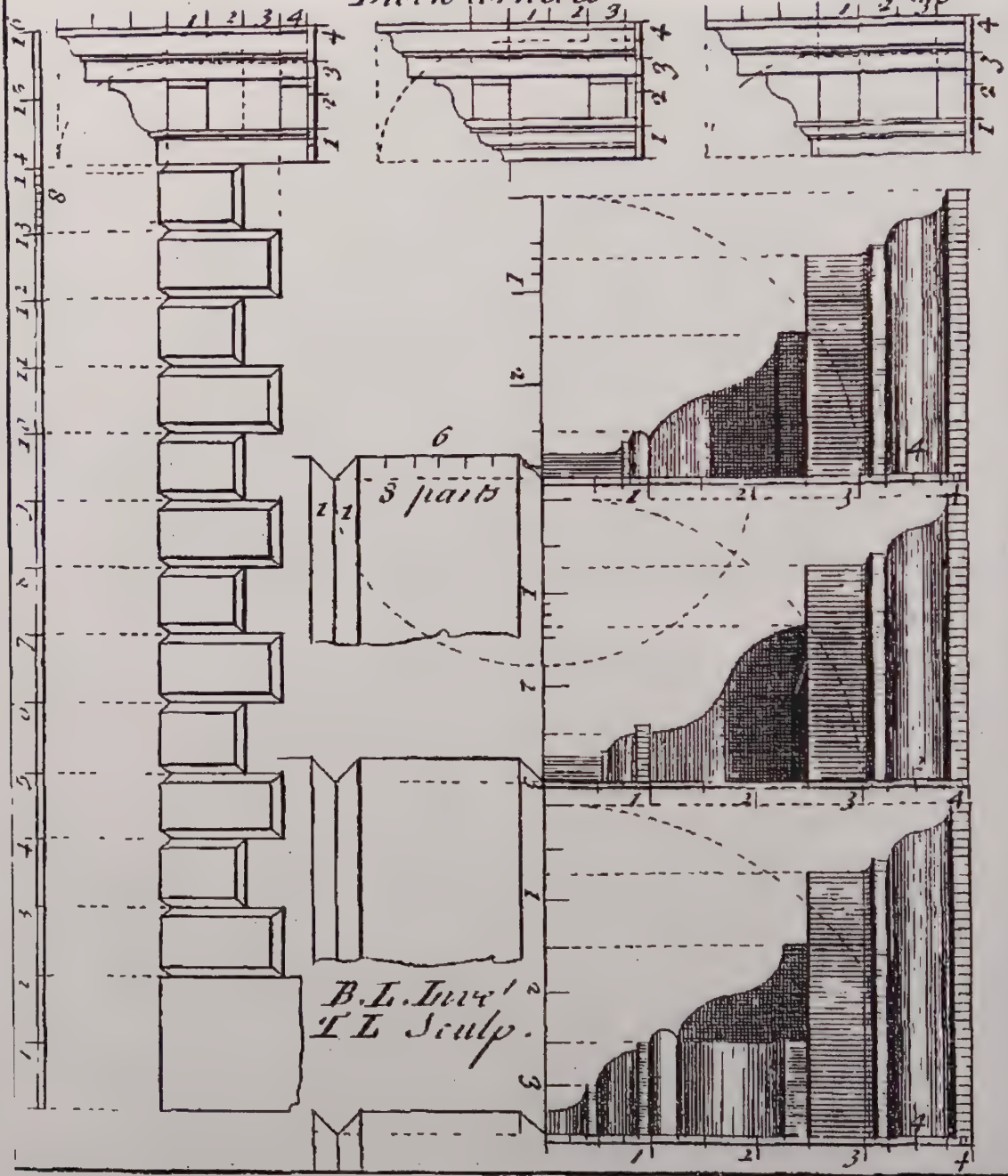




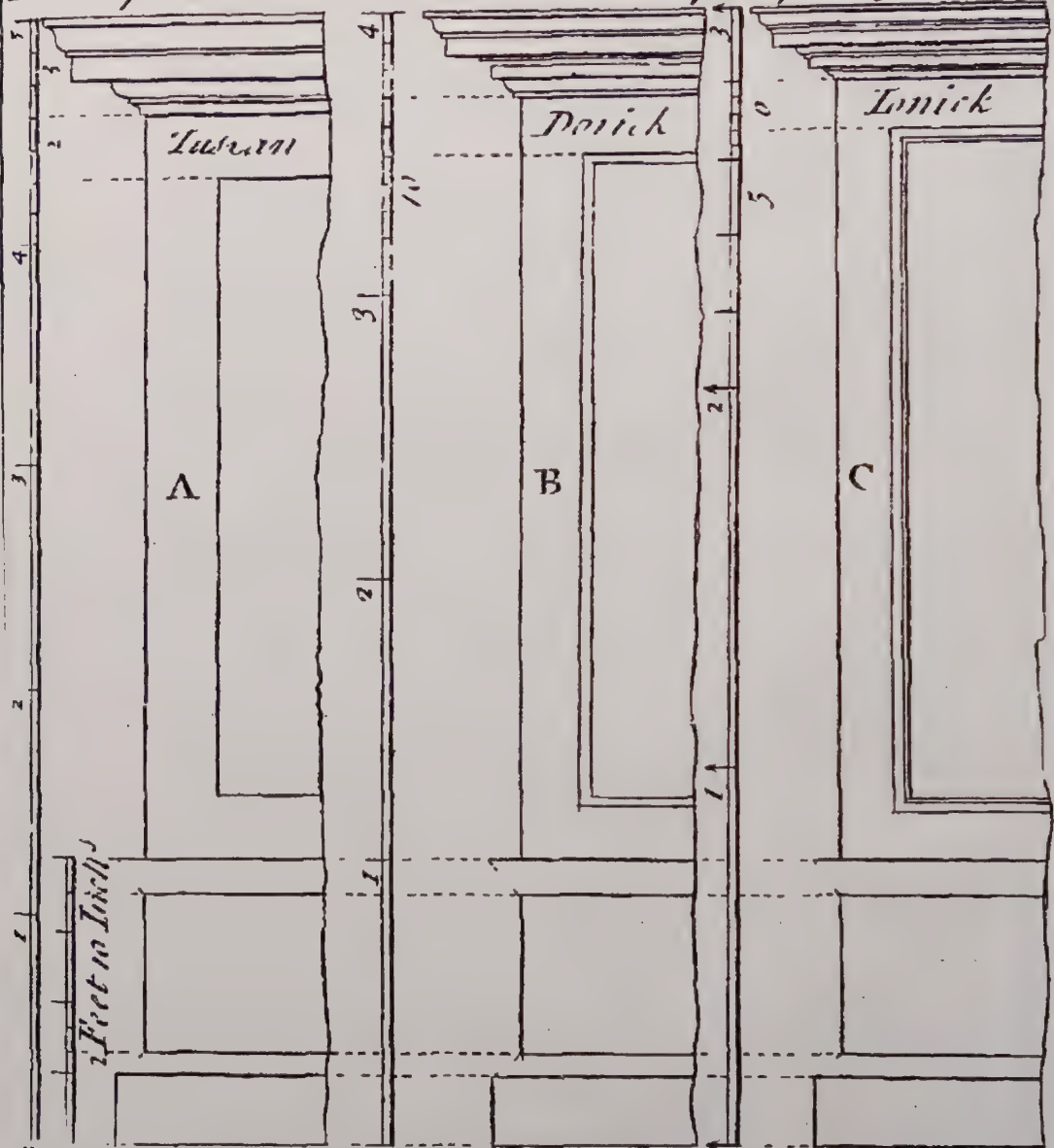


Block Cornices

Pl. 75

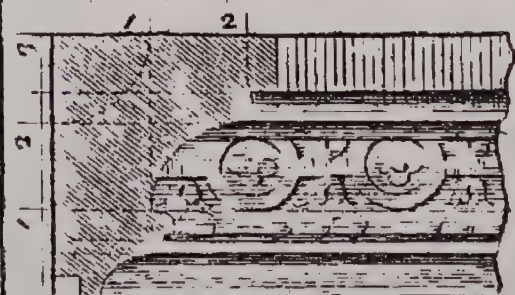
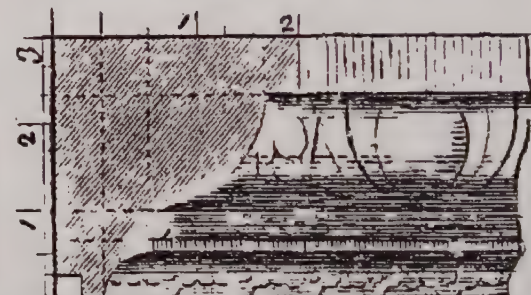
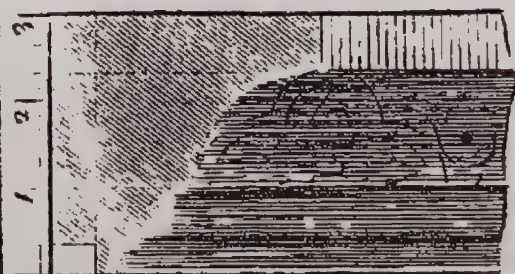
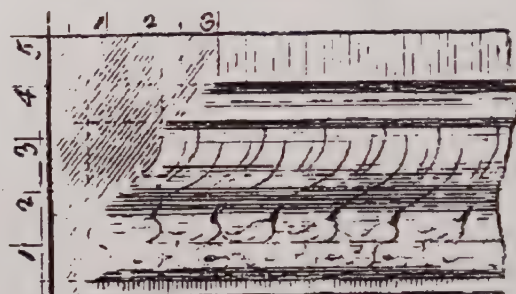
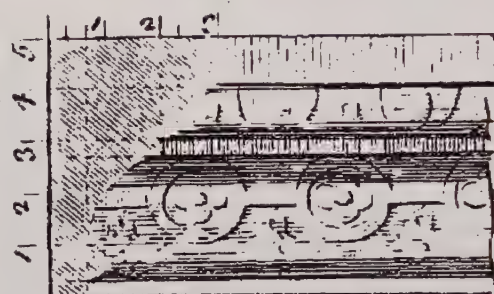
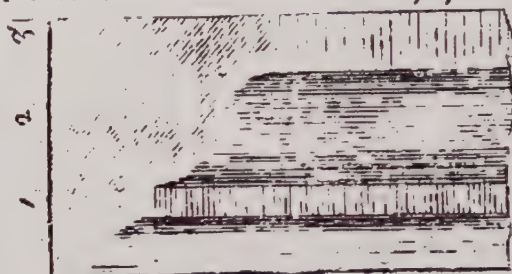
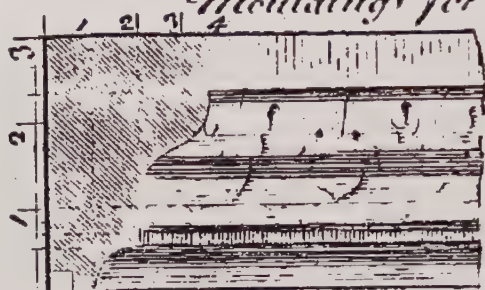


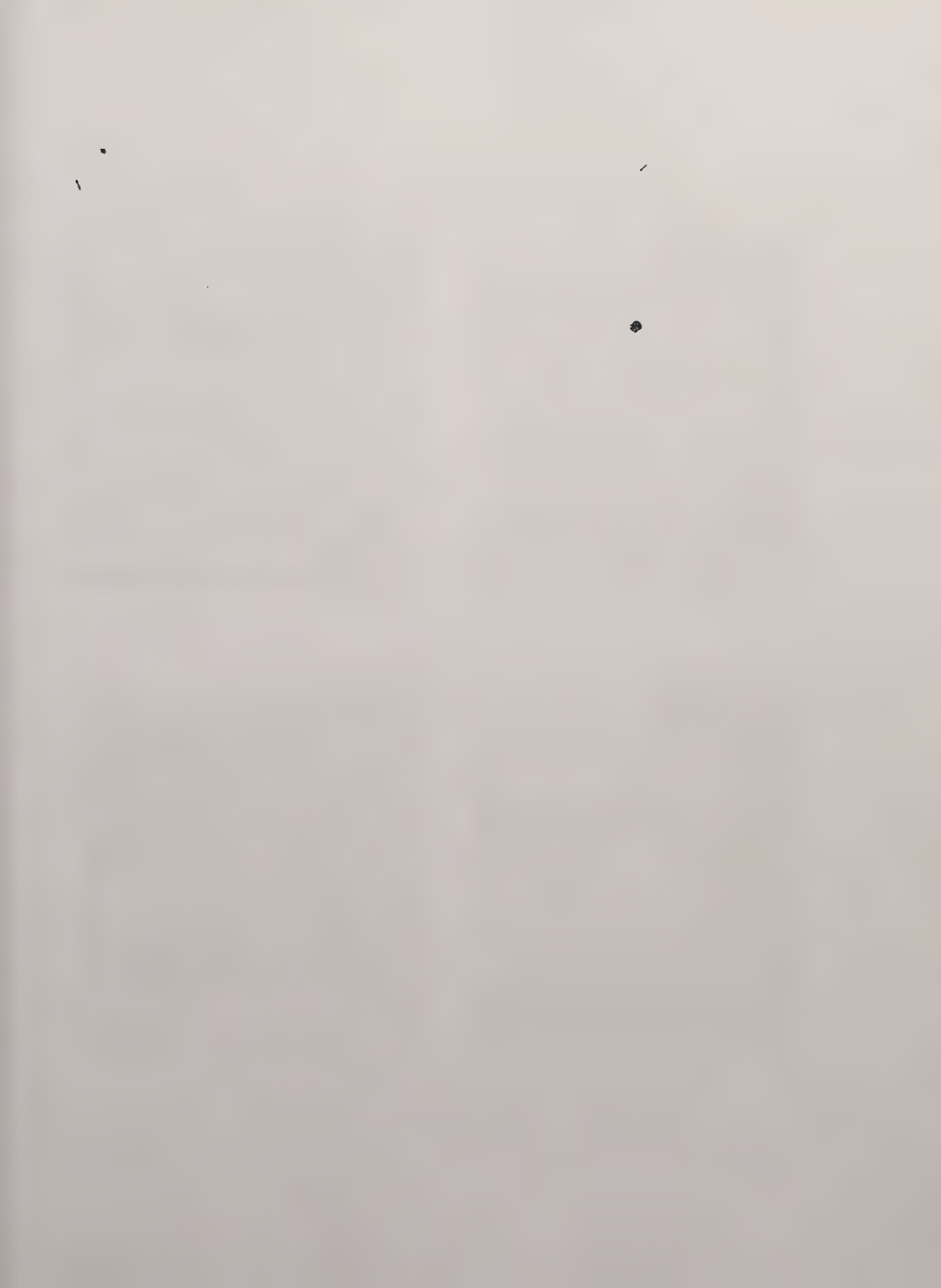
To Proportion Cornices to Rooms of any Height. Pl 76



P. 1. 1740

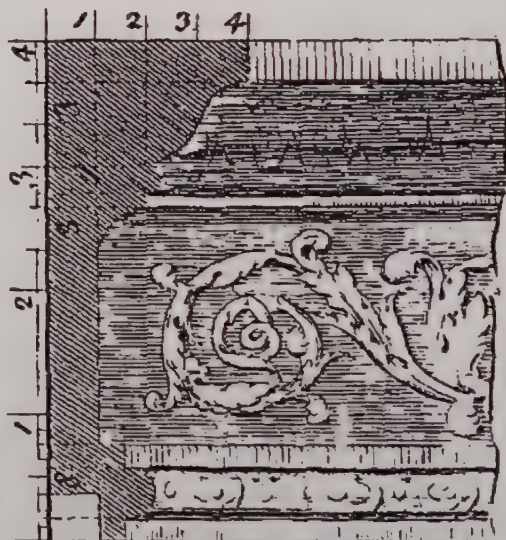
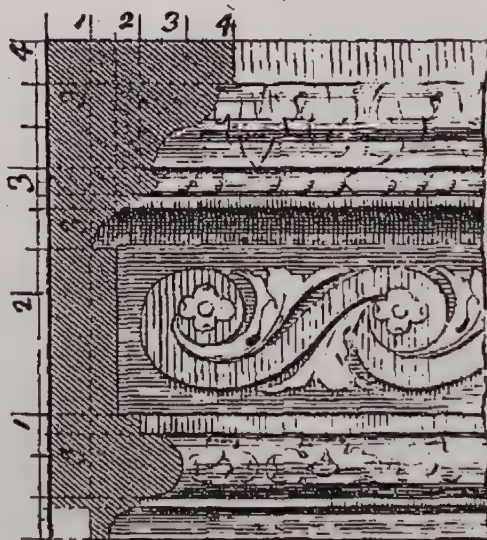
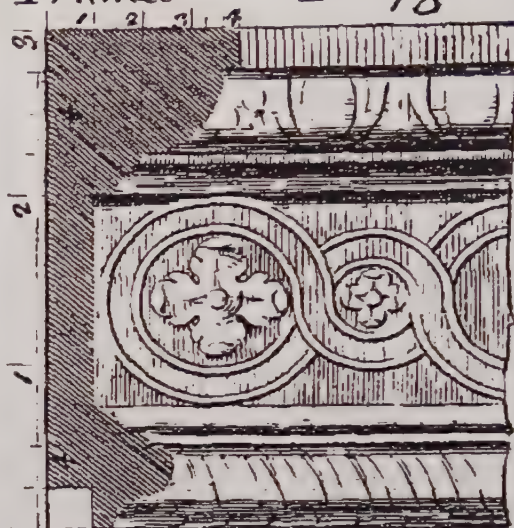
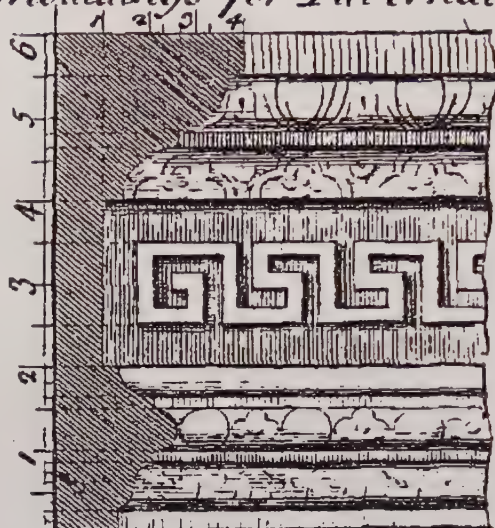
T.L. Sculp





Mouldings for Tabernacle Frames

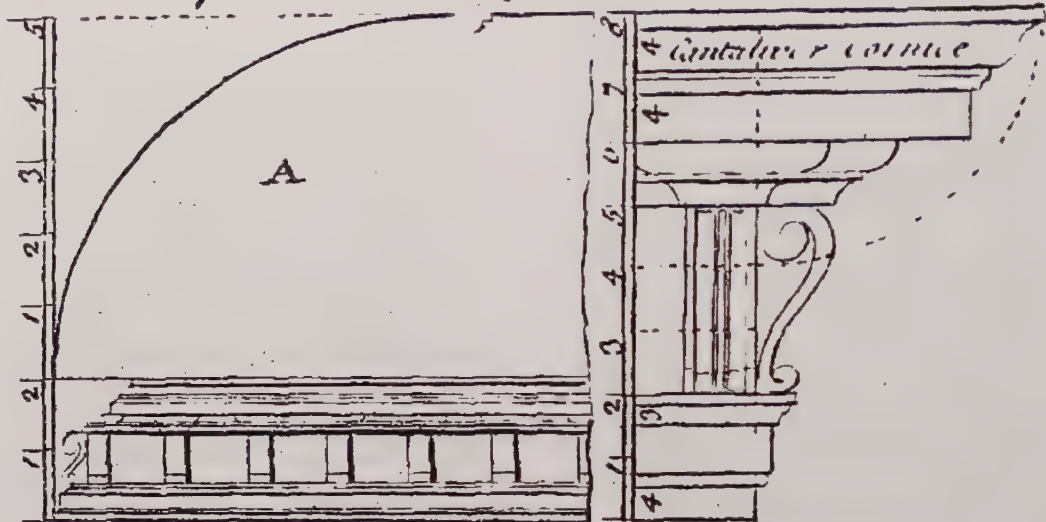
Pl 78



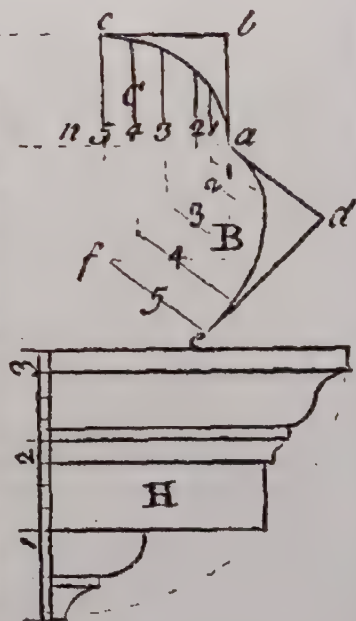
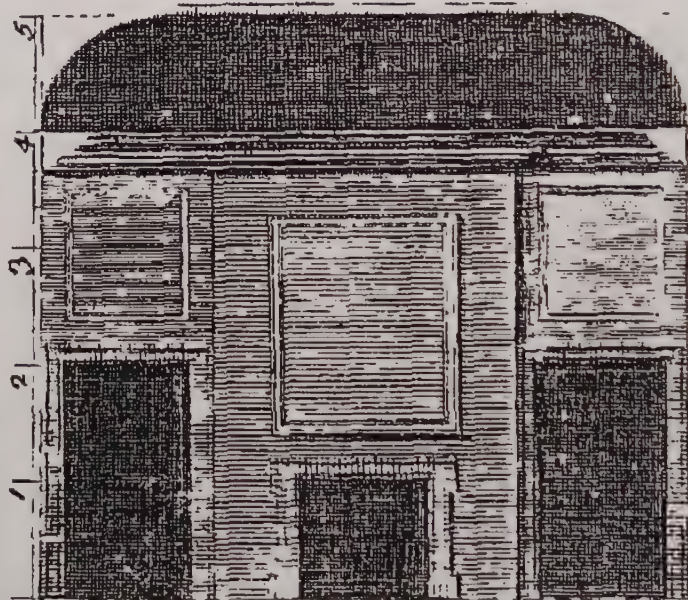
Thomas Langley Inv. and Sculp 1741

A Cove $\frac{1}{4}$ of the entire Height

Pl 79



A Cove $\frac{1}{5}$ of the entire Height.

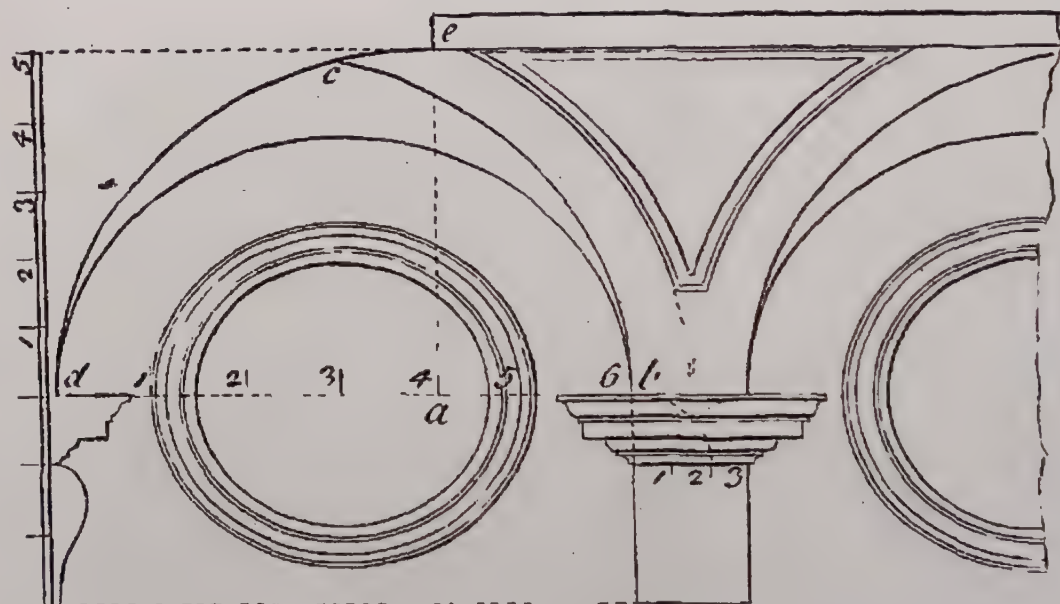
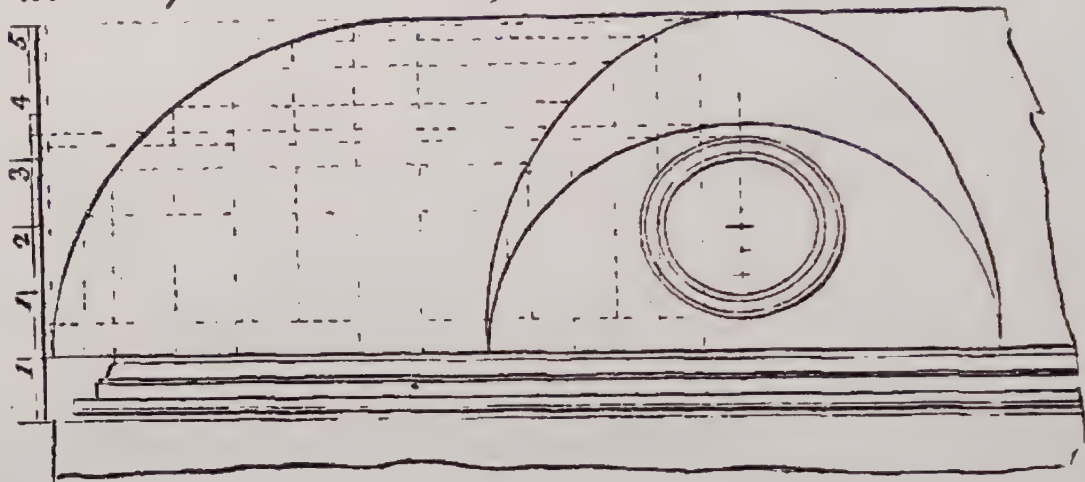


B L Inv. 1741.

T L Sculp

Coves $\frac{1}{6}$ of the entire Height.

Pl. 80.

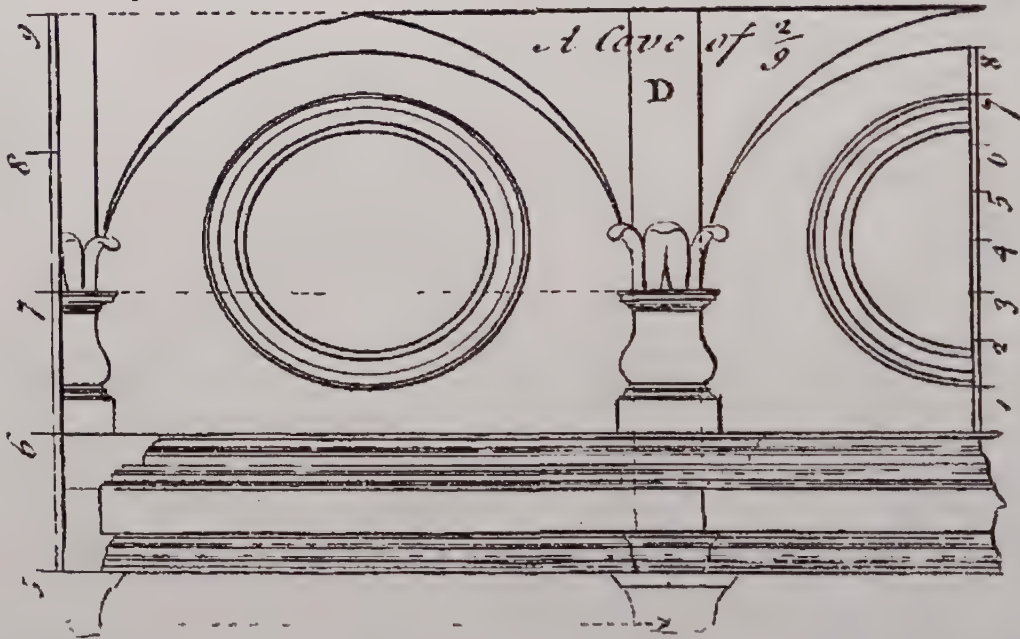
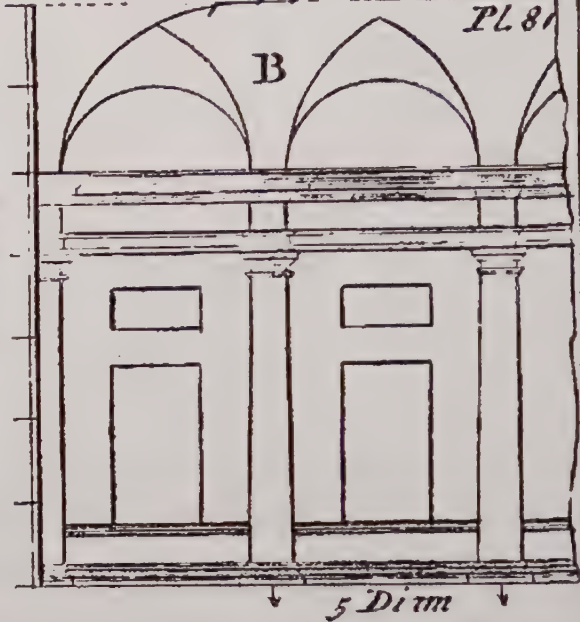


BL Inv. 1741.

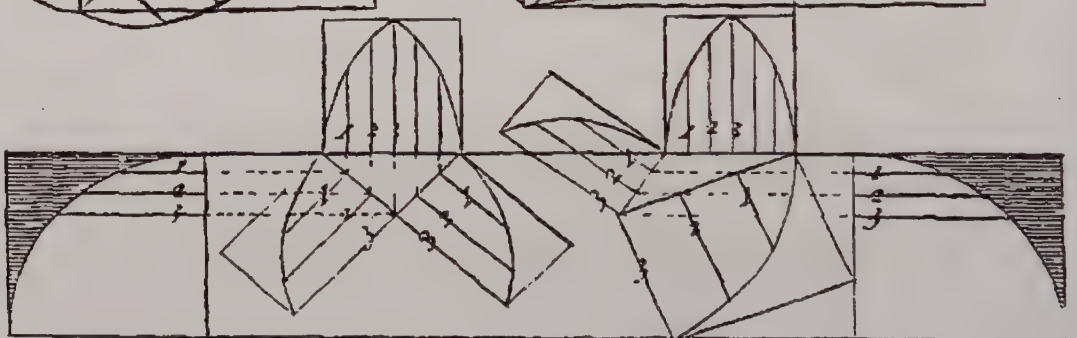
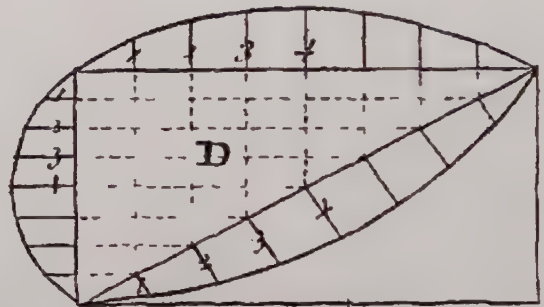
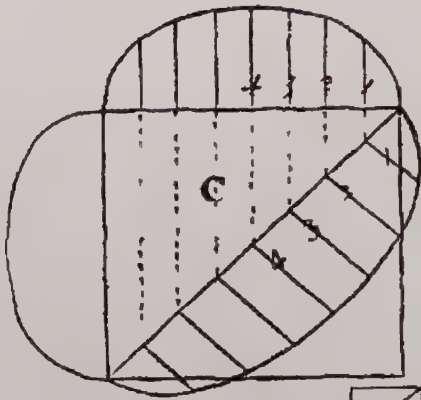
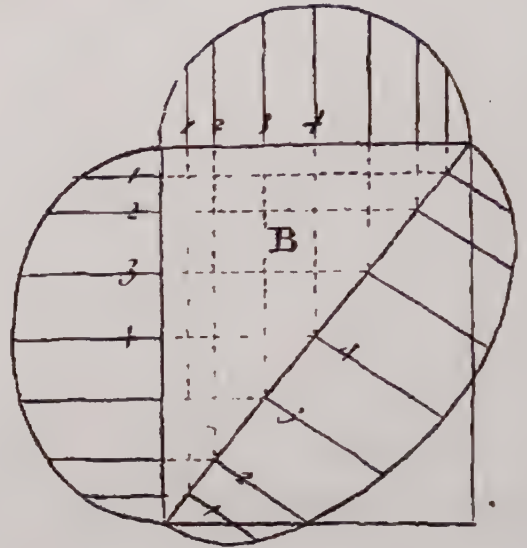
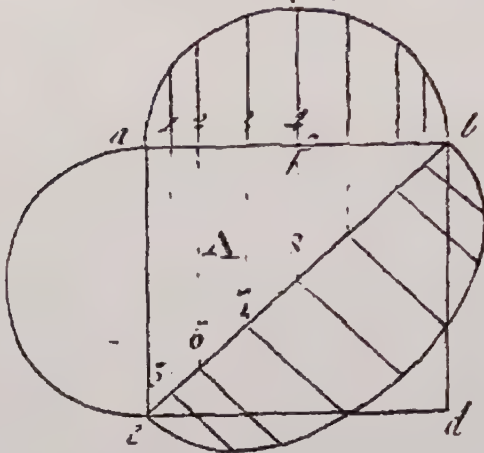
TL Sculp.

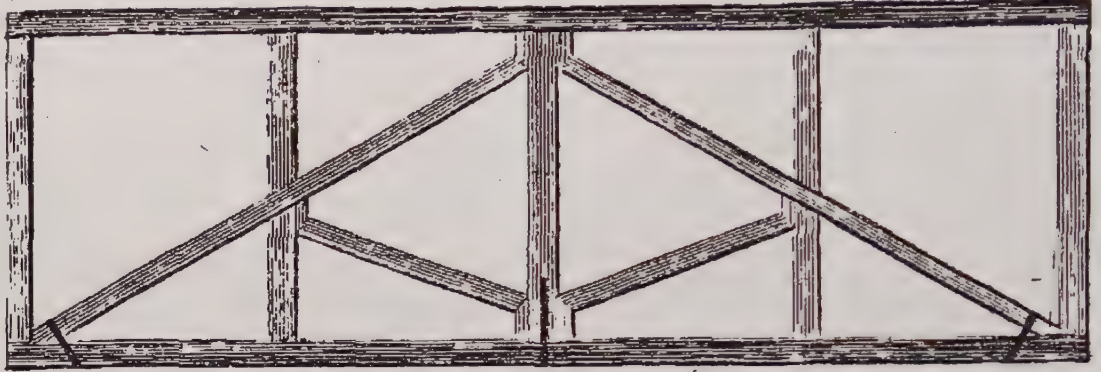
A Cove $\frac{1}{2}$ of the entire Height A Cove $\frac{2}{3}$ of $\frac{1}{2}$ entire Height

PL 81

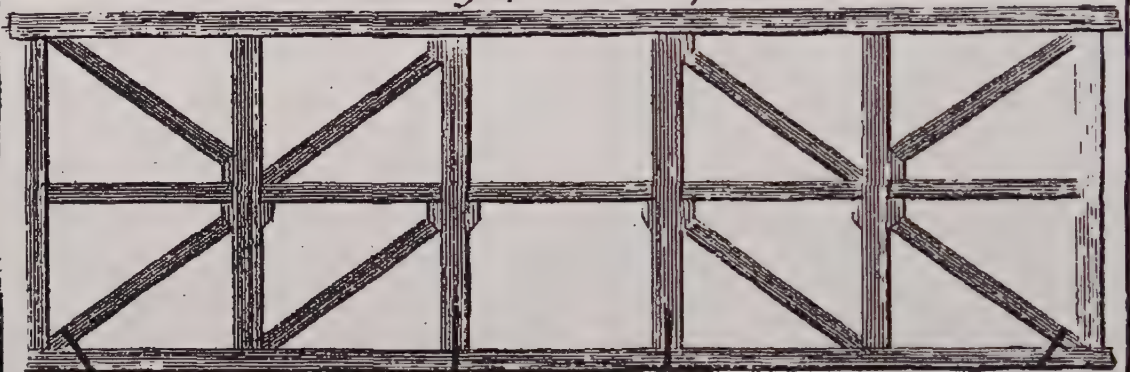


in the base of the

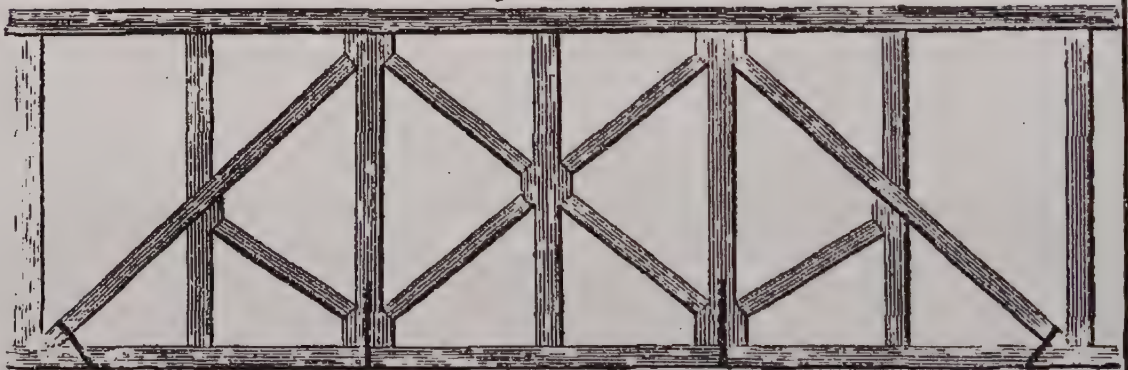




Bearing 40 Feet in 4 Clear

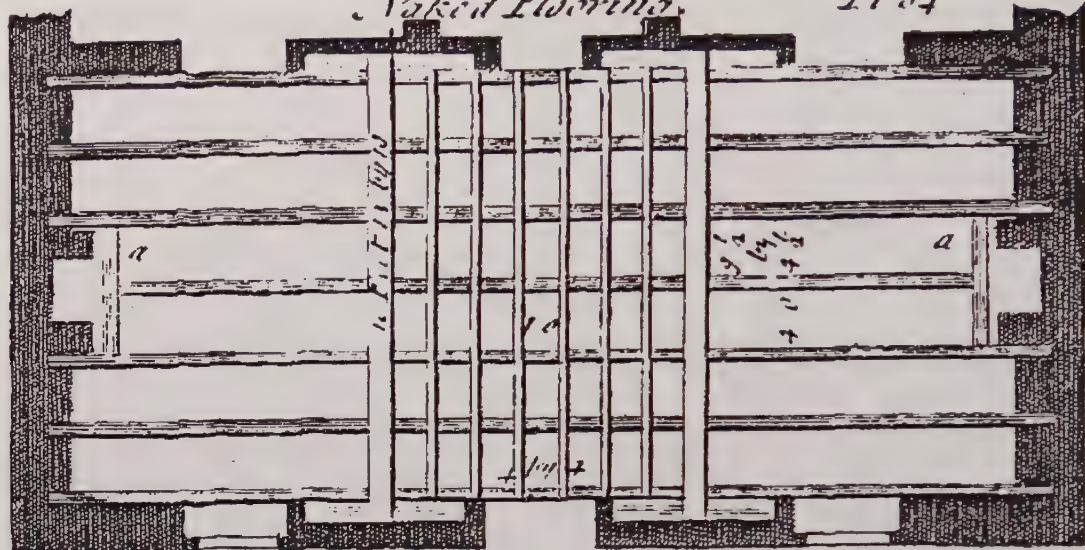


50 Feet



B L for 1741

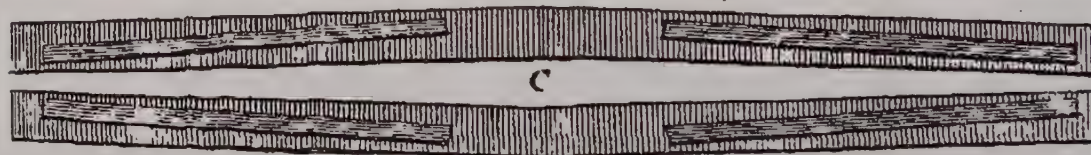
50 Feet.



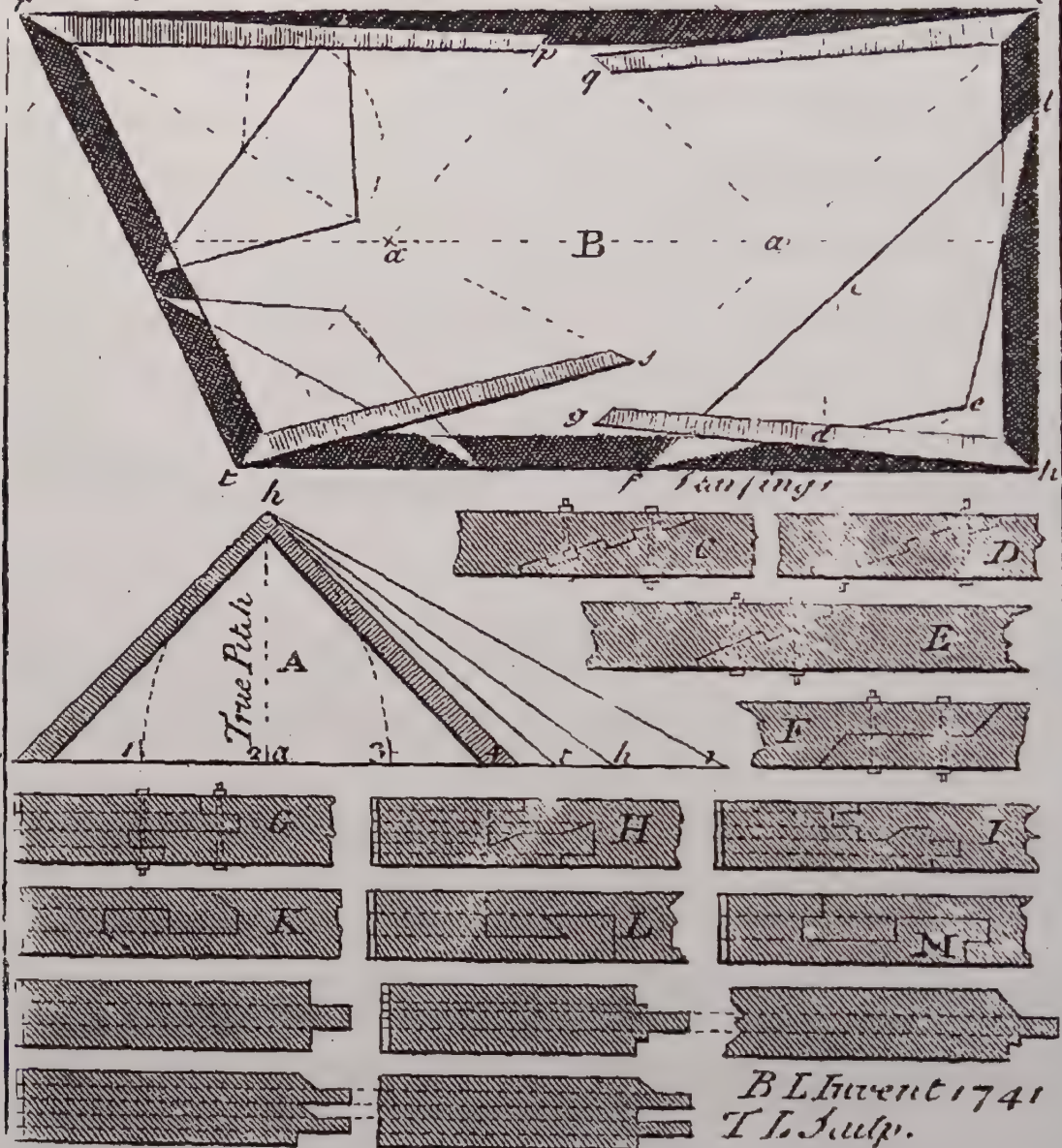
Truss'd Girders



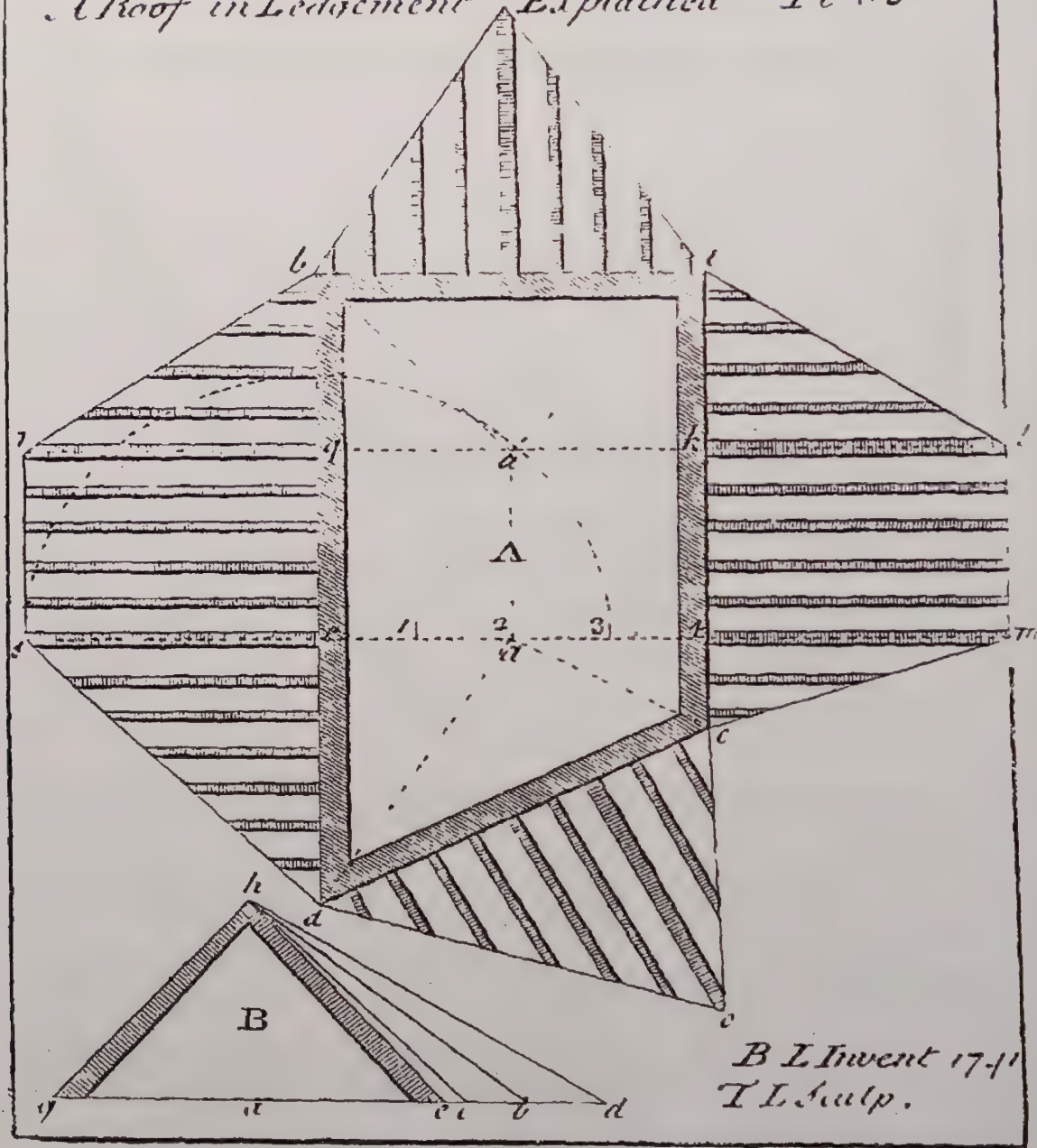
Length 24 Feet

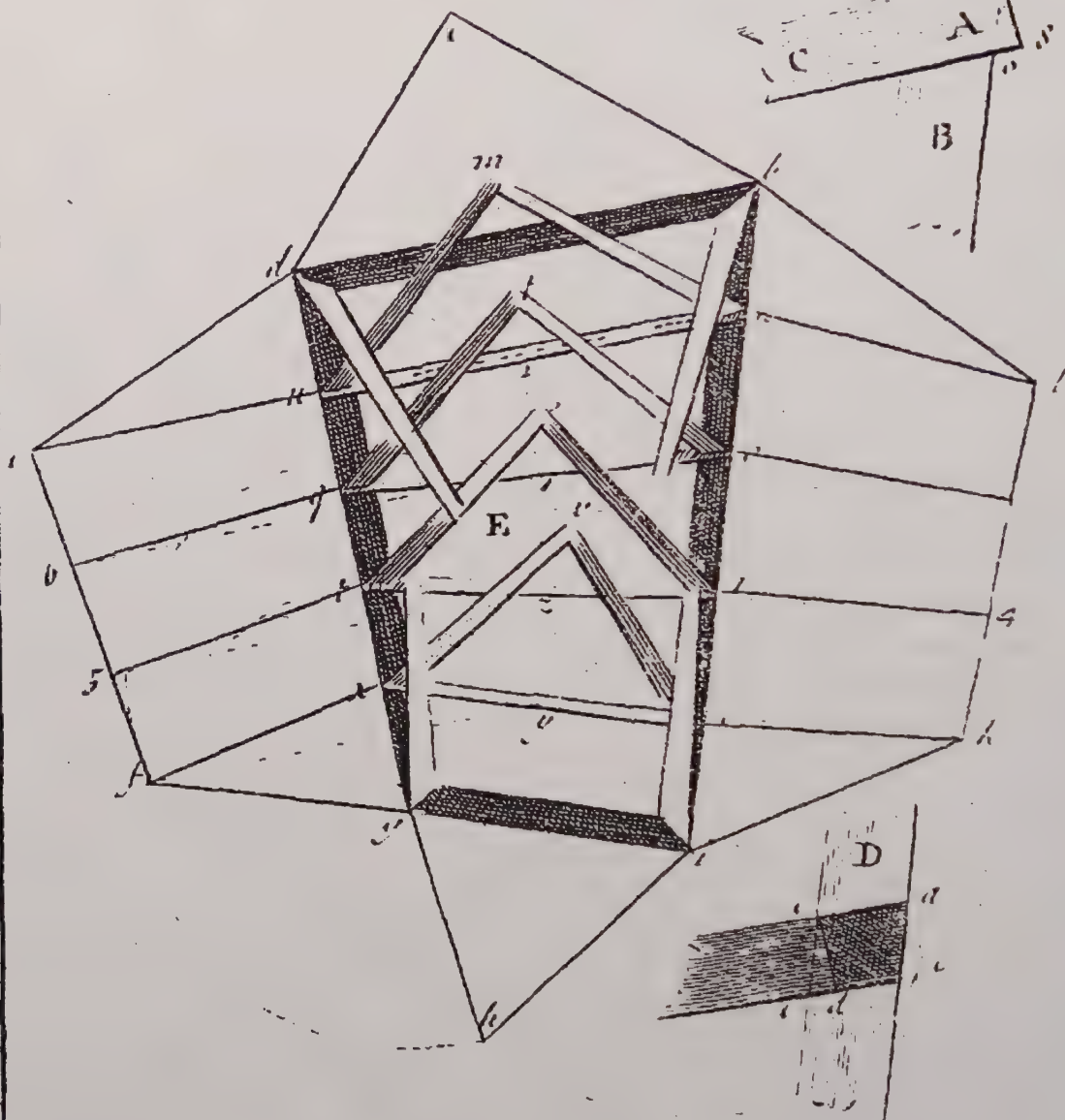


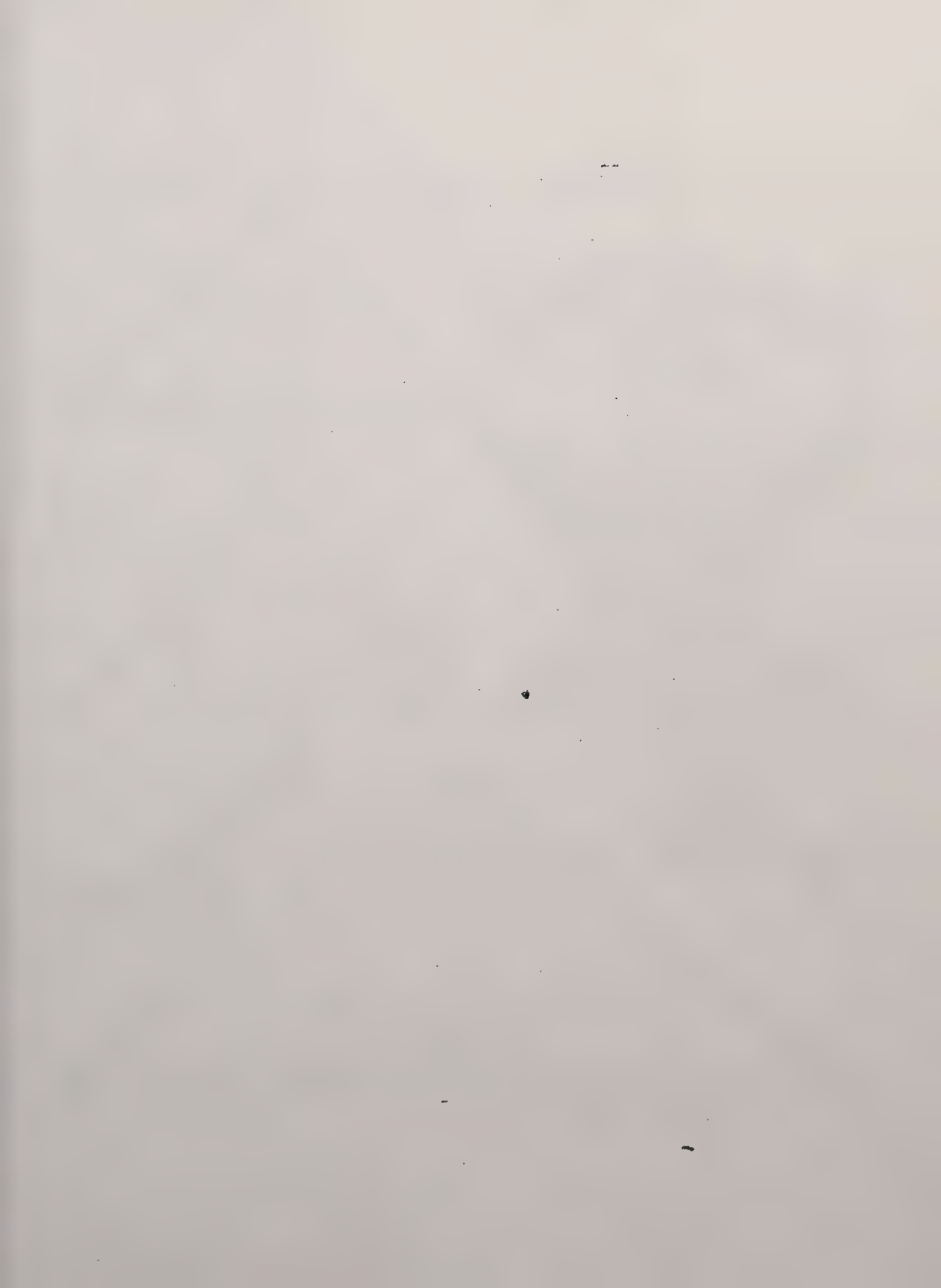
The Lengths & Banks of Hep Ryfters Explained Pl 85.



A Roof in Ledge ment Explained Pl 86

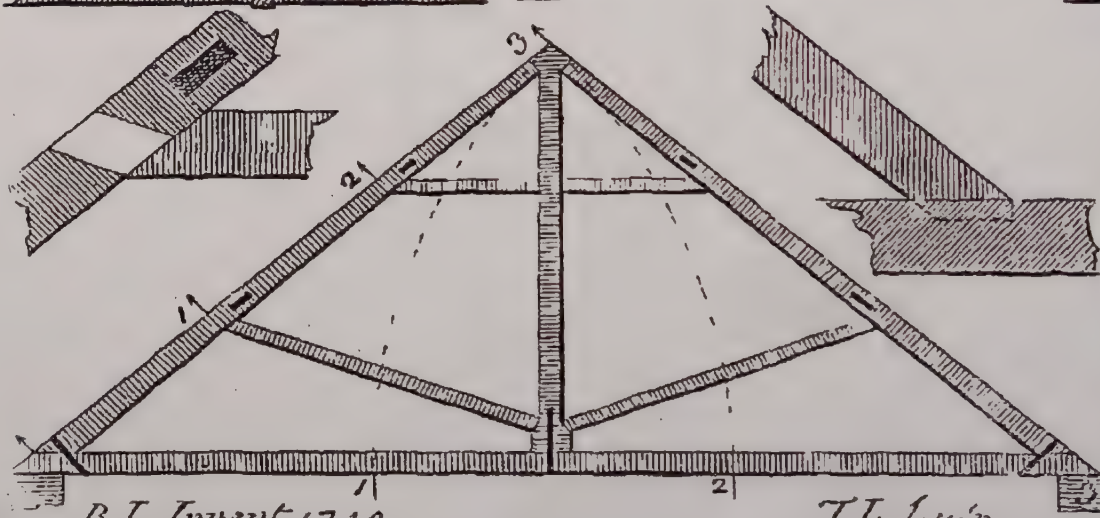
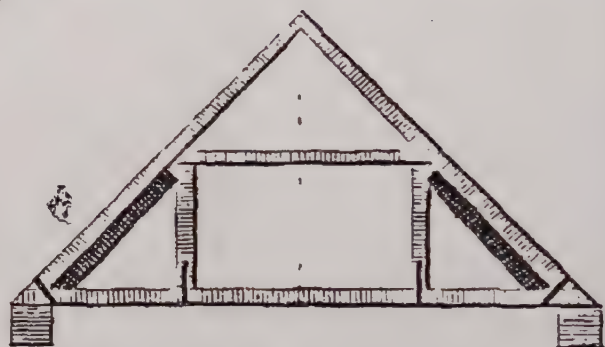
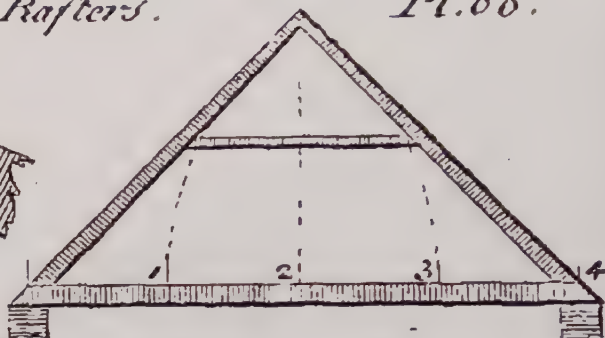
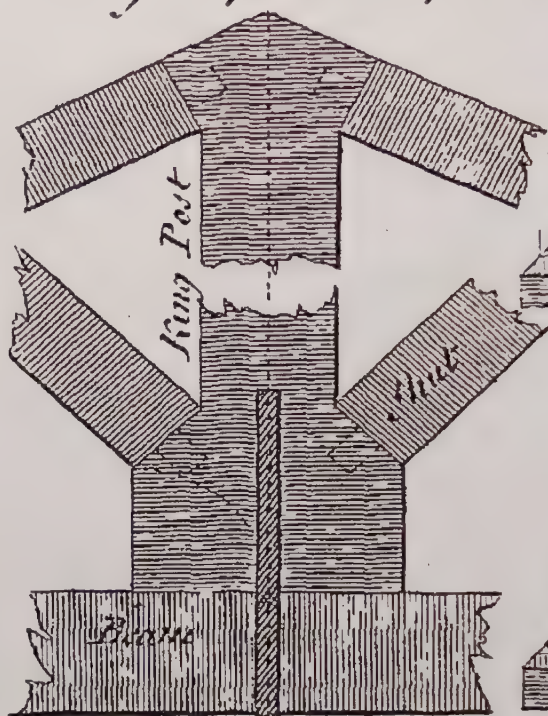






Truss's for Principal Rafters.

Pl. 88.

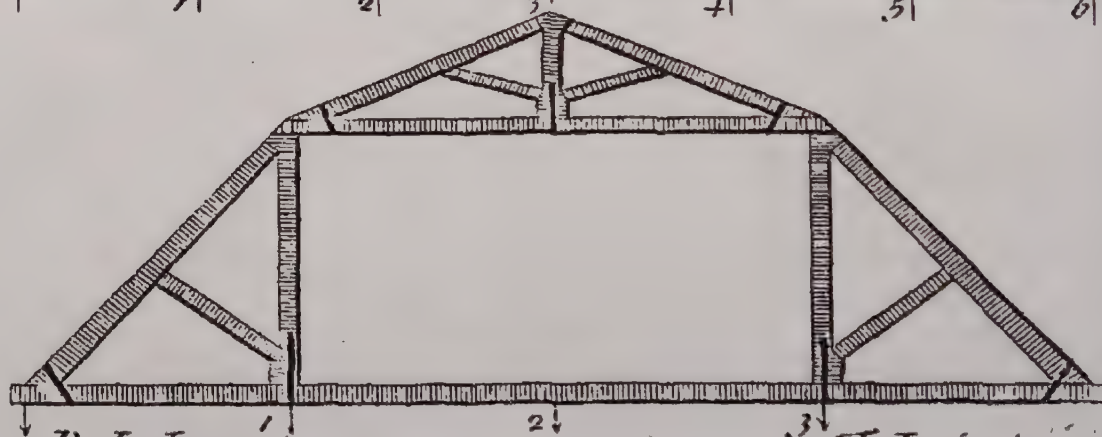
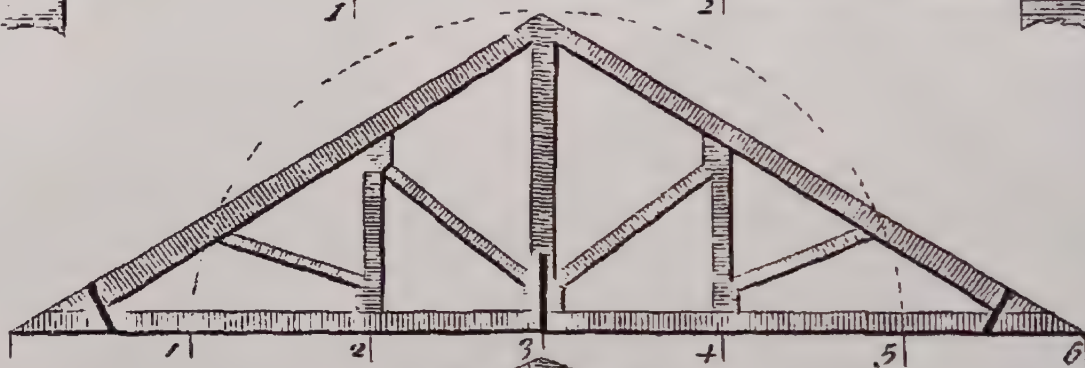
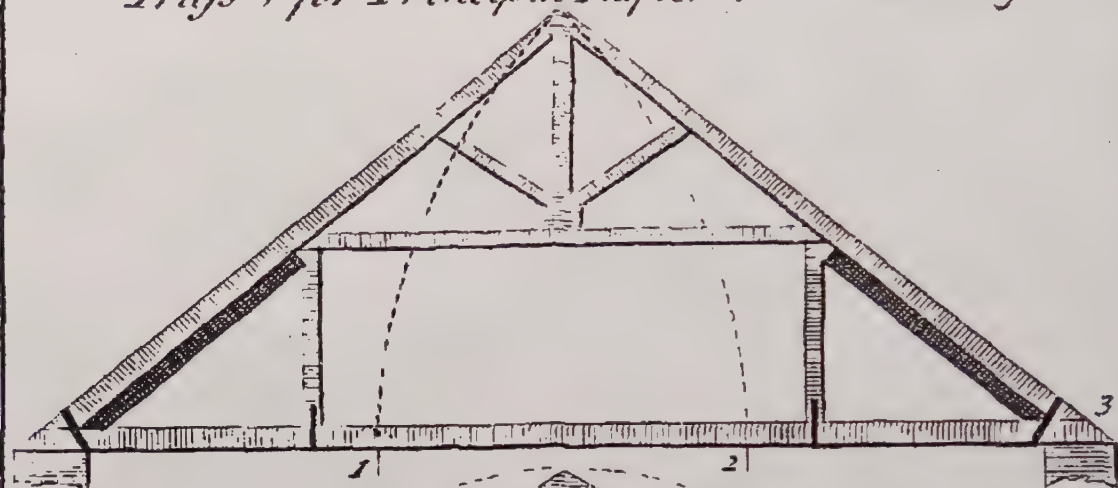


B L Invent 1740

TL Inup

Truss for Principal Rafters.

Pl. 89

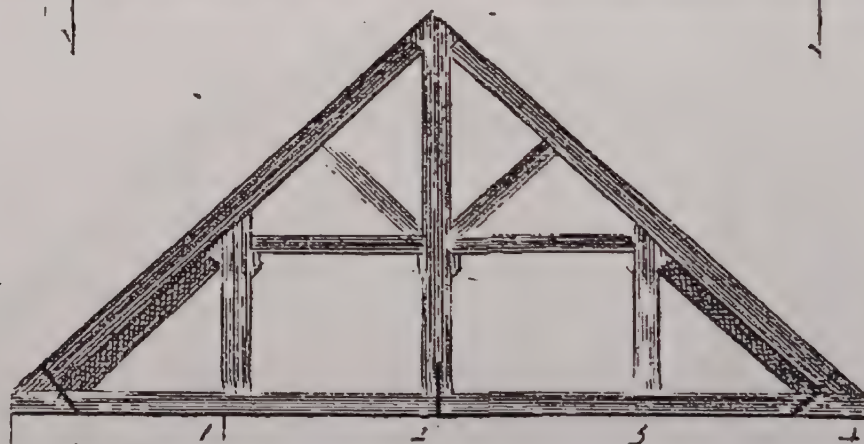
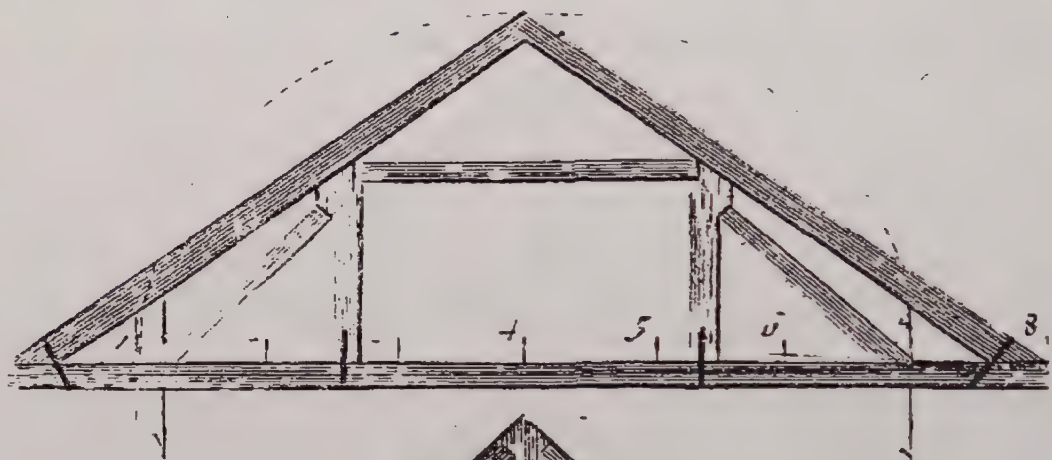


B L Invent 1741

T L Sup

*Truss's for
Roofs*

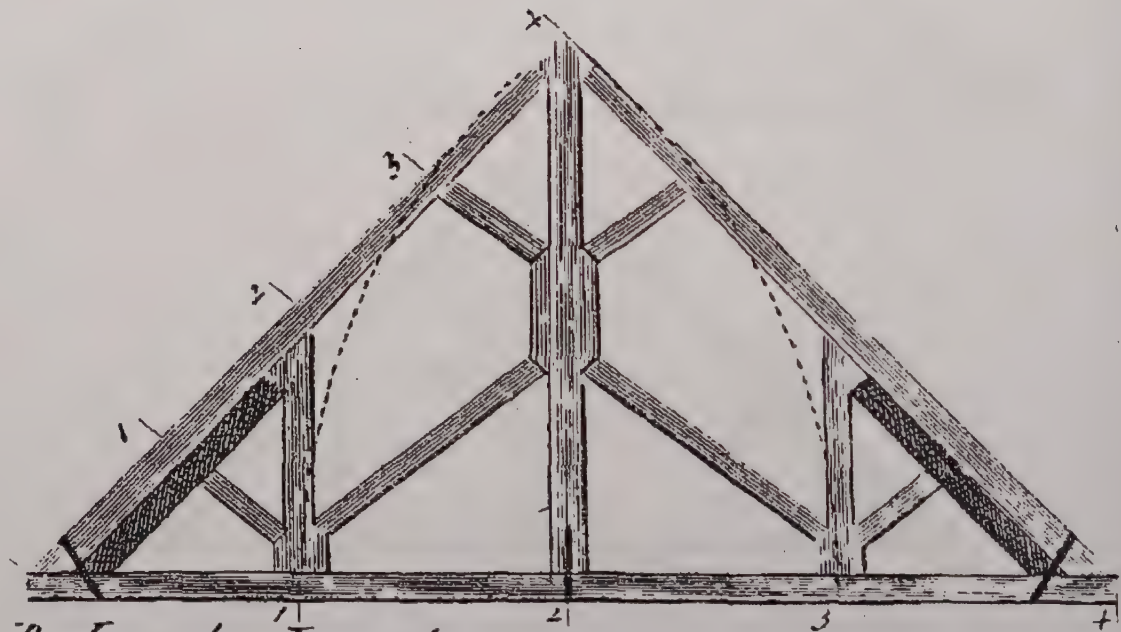
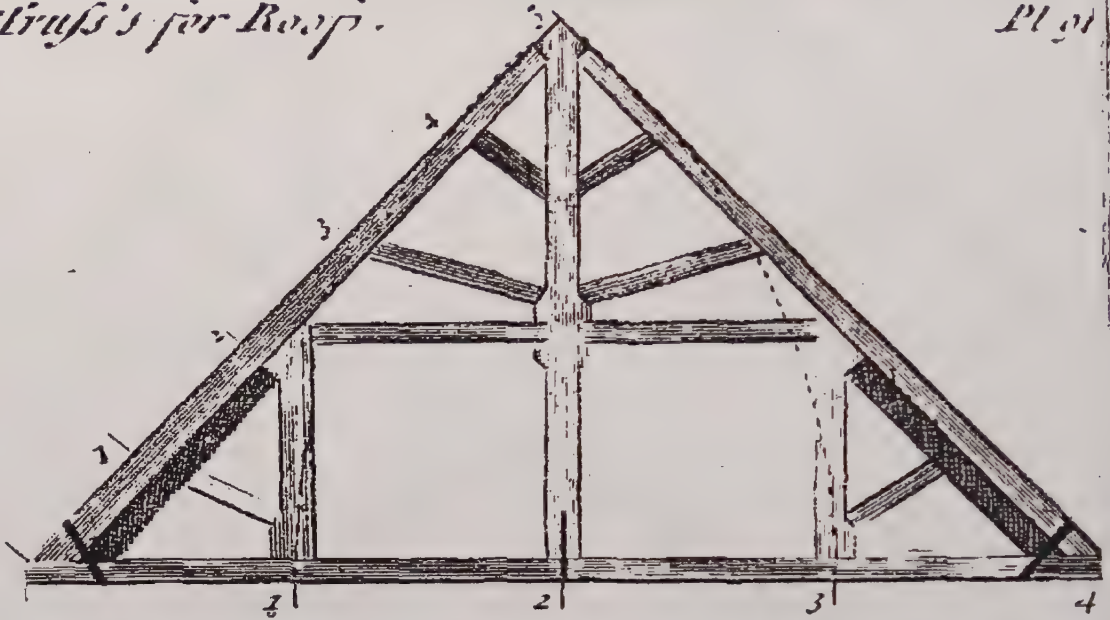
Pl. 20.



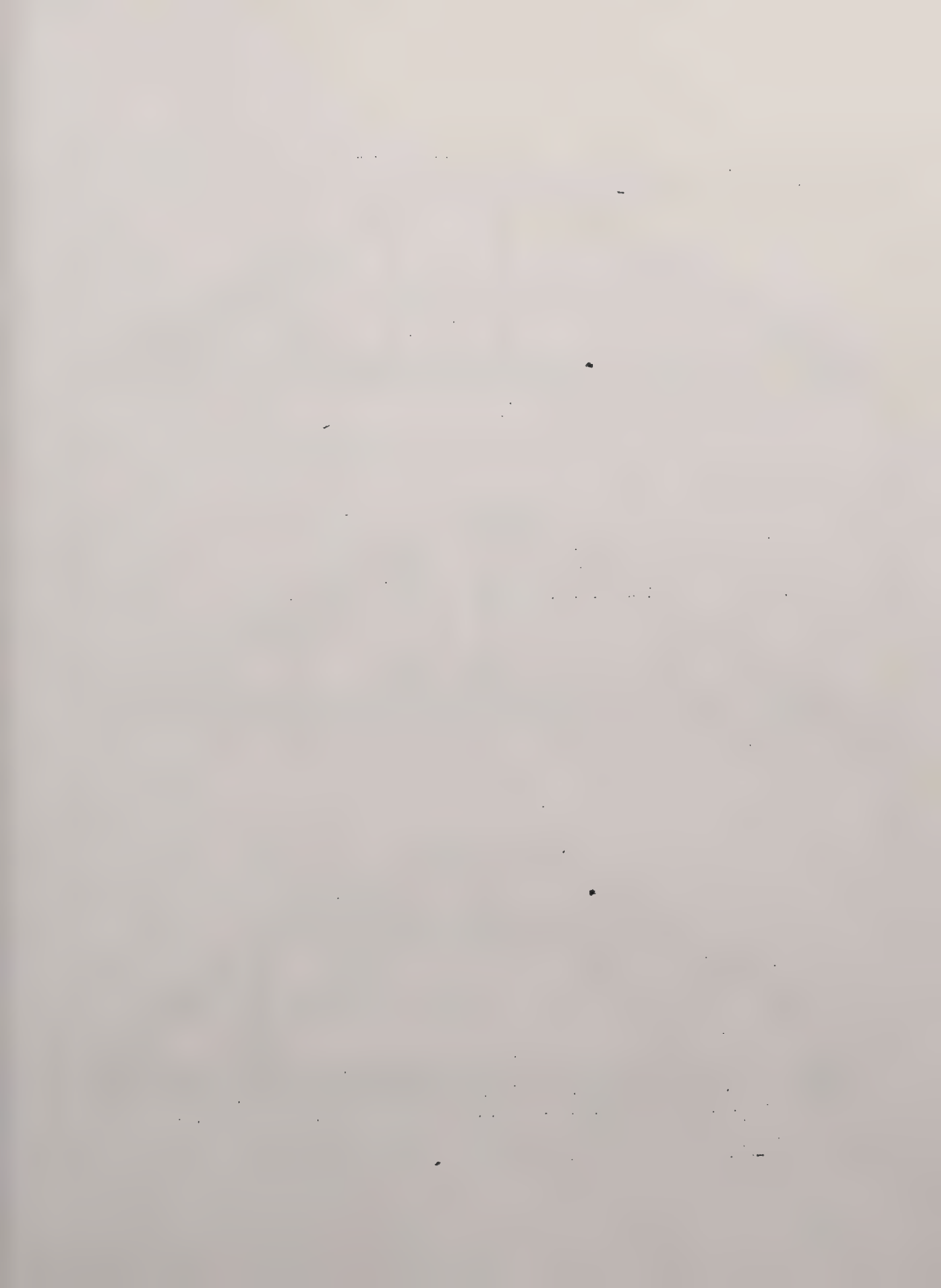
B Langley Invent 1741

Truss's for Roofs.

Pl 91

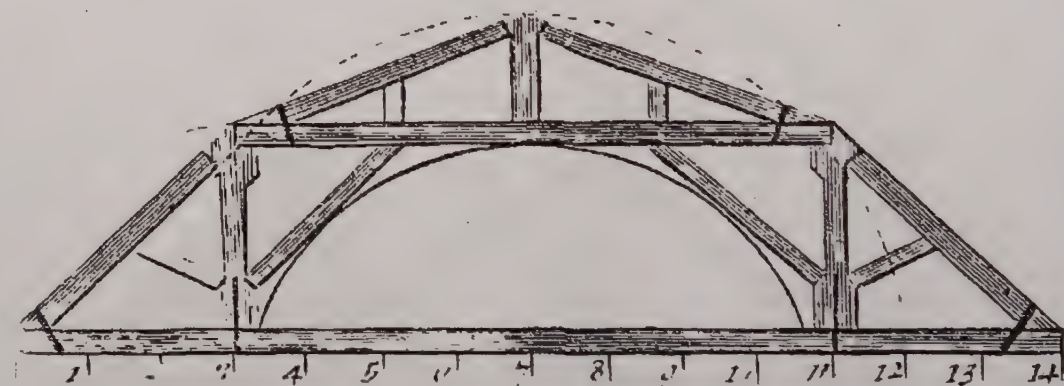
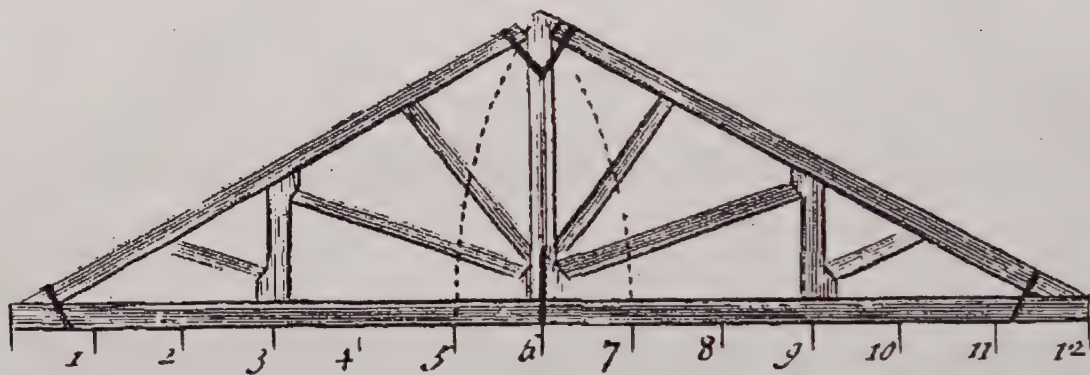
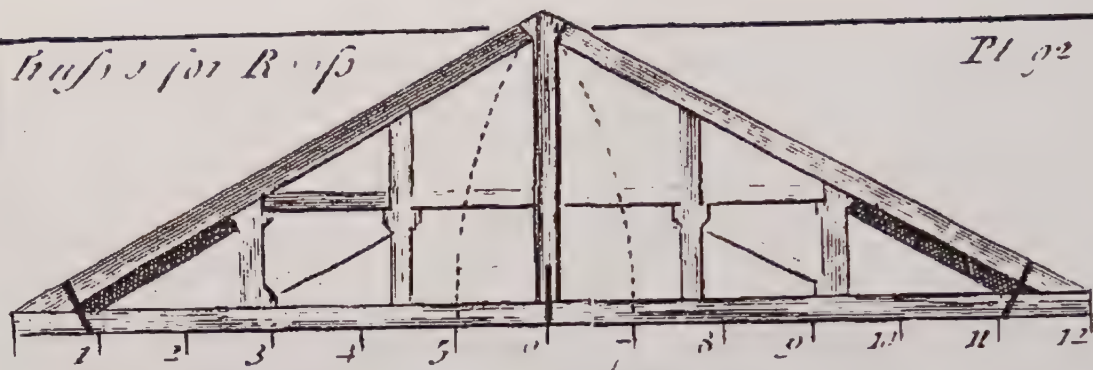


B Langley Invent 1741



Haus für Röß

Pl 92



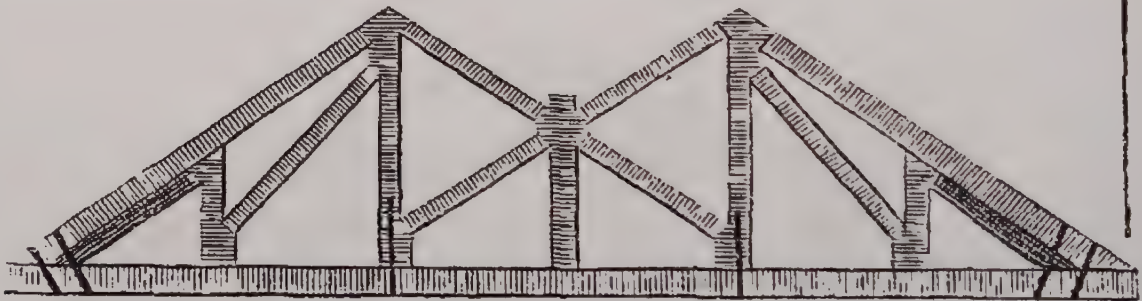
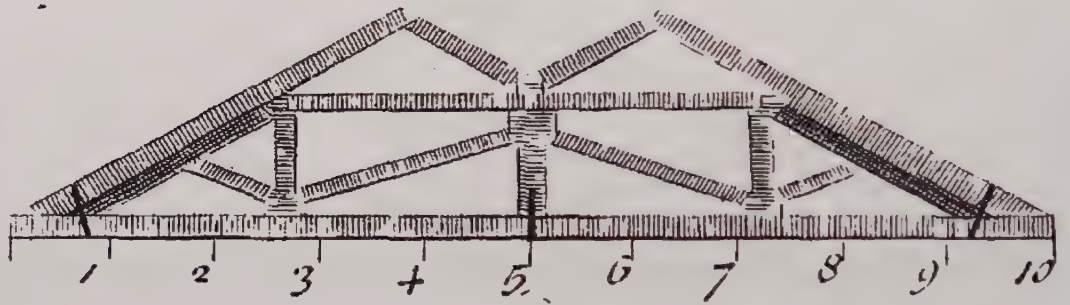
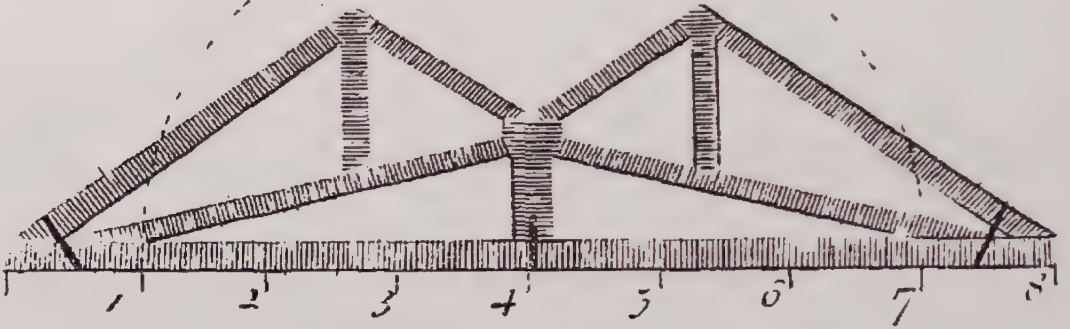
B. F. Arnold & Co. Inventors



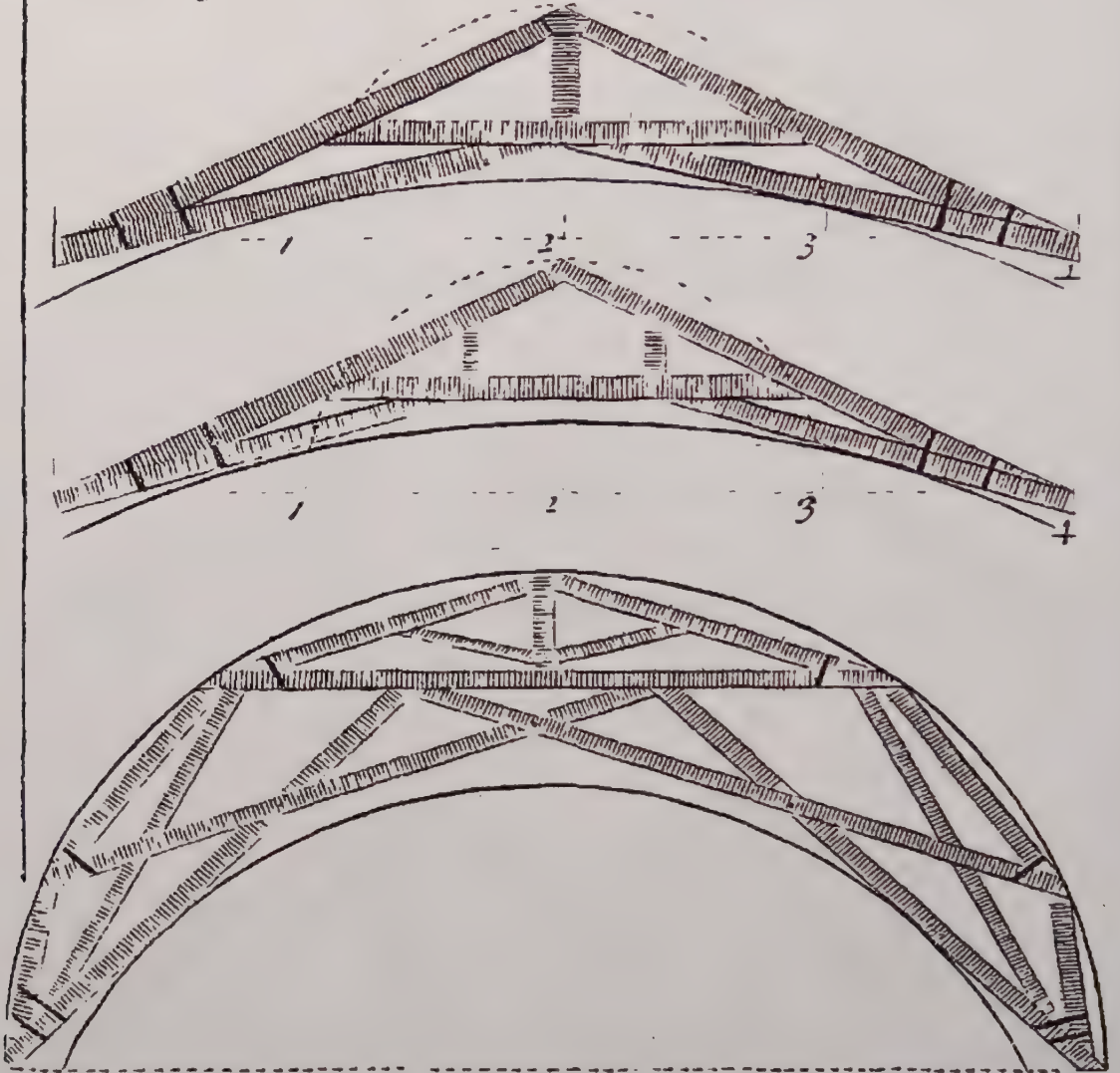
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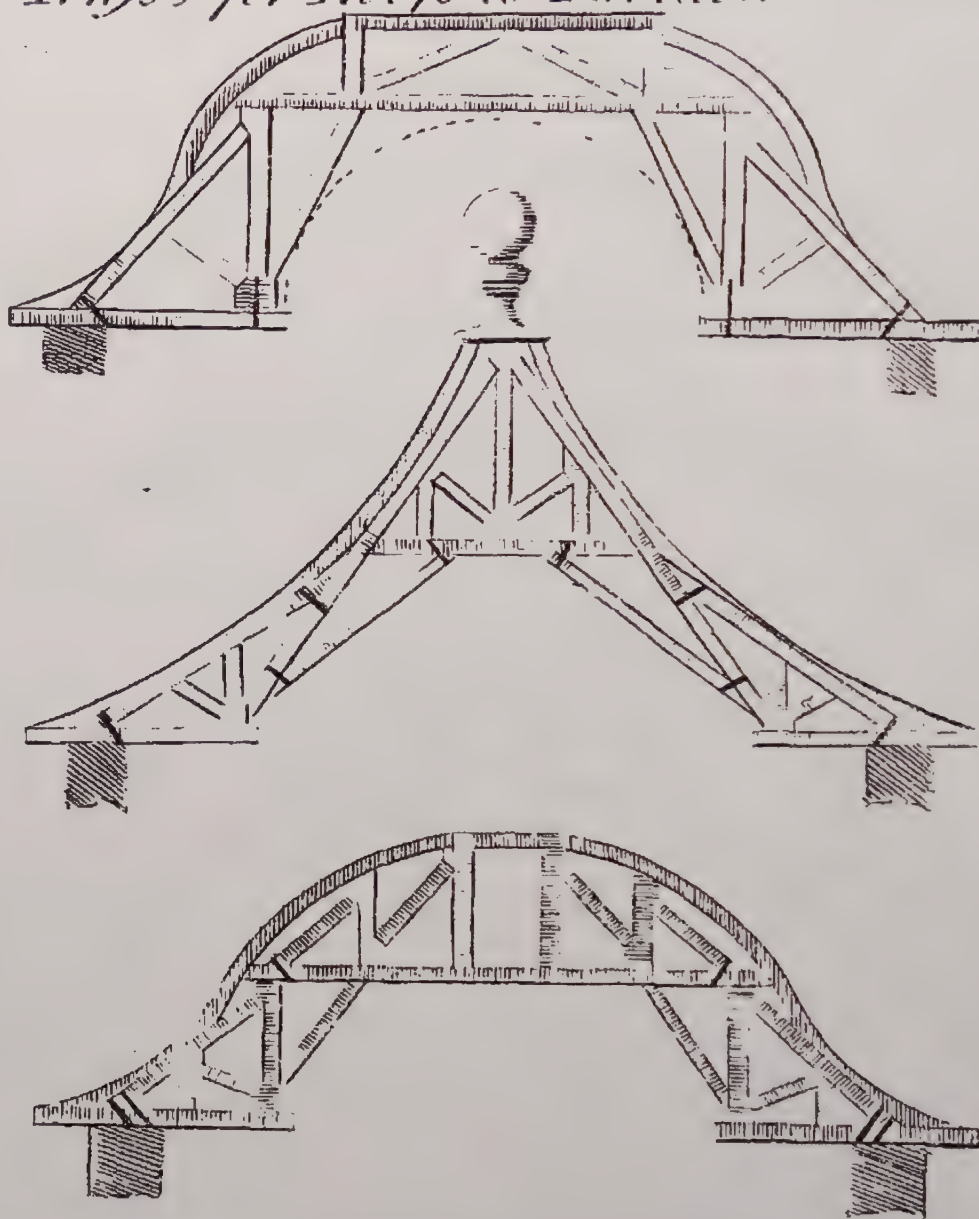
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Three Truss's for 11 Roofs Pl. 93



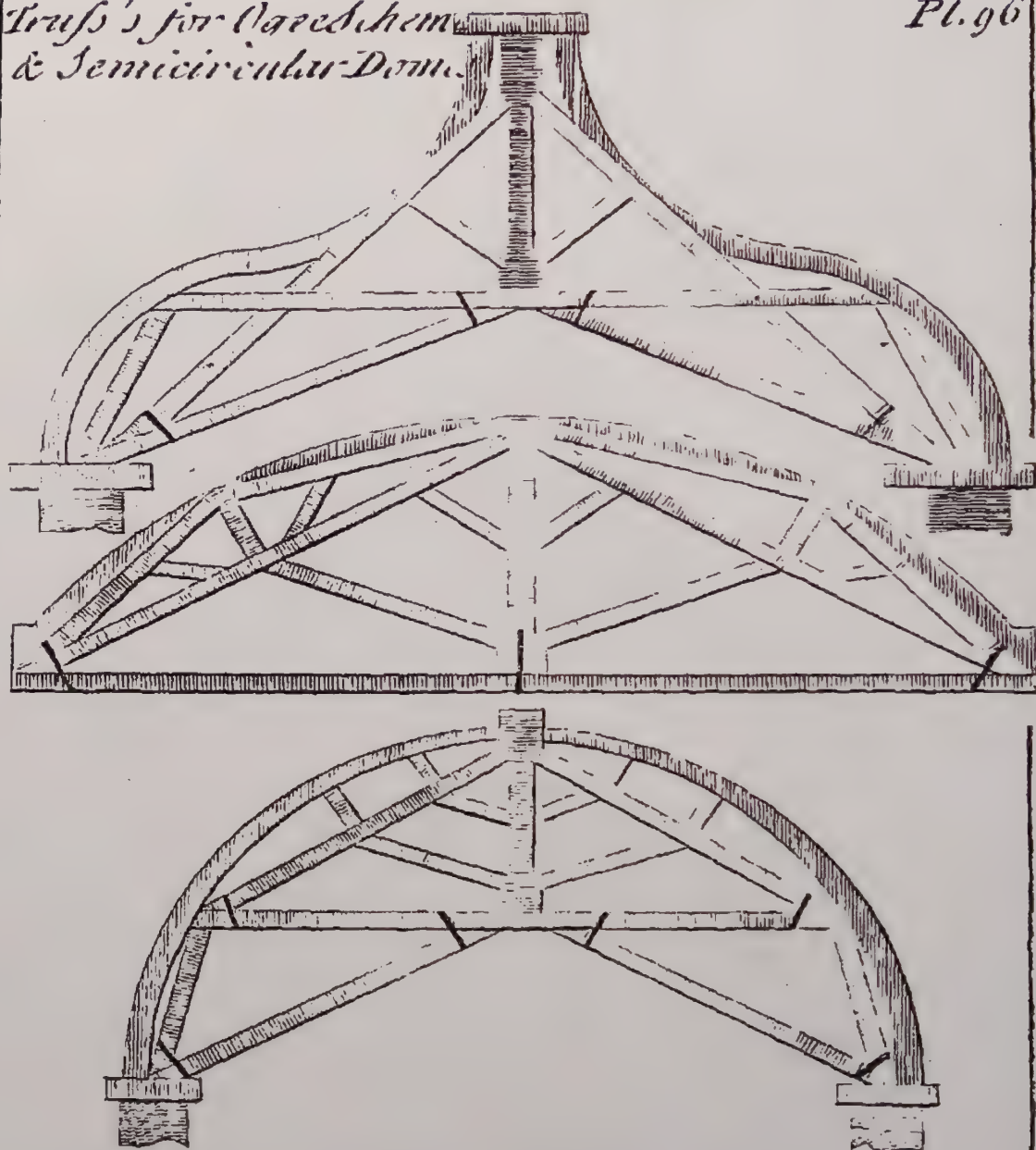
Truss s. for Roofs, over arch'd cellings. Pl 94

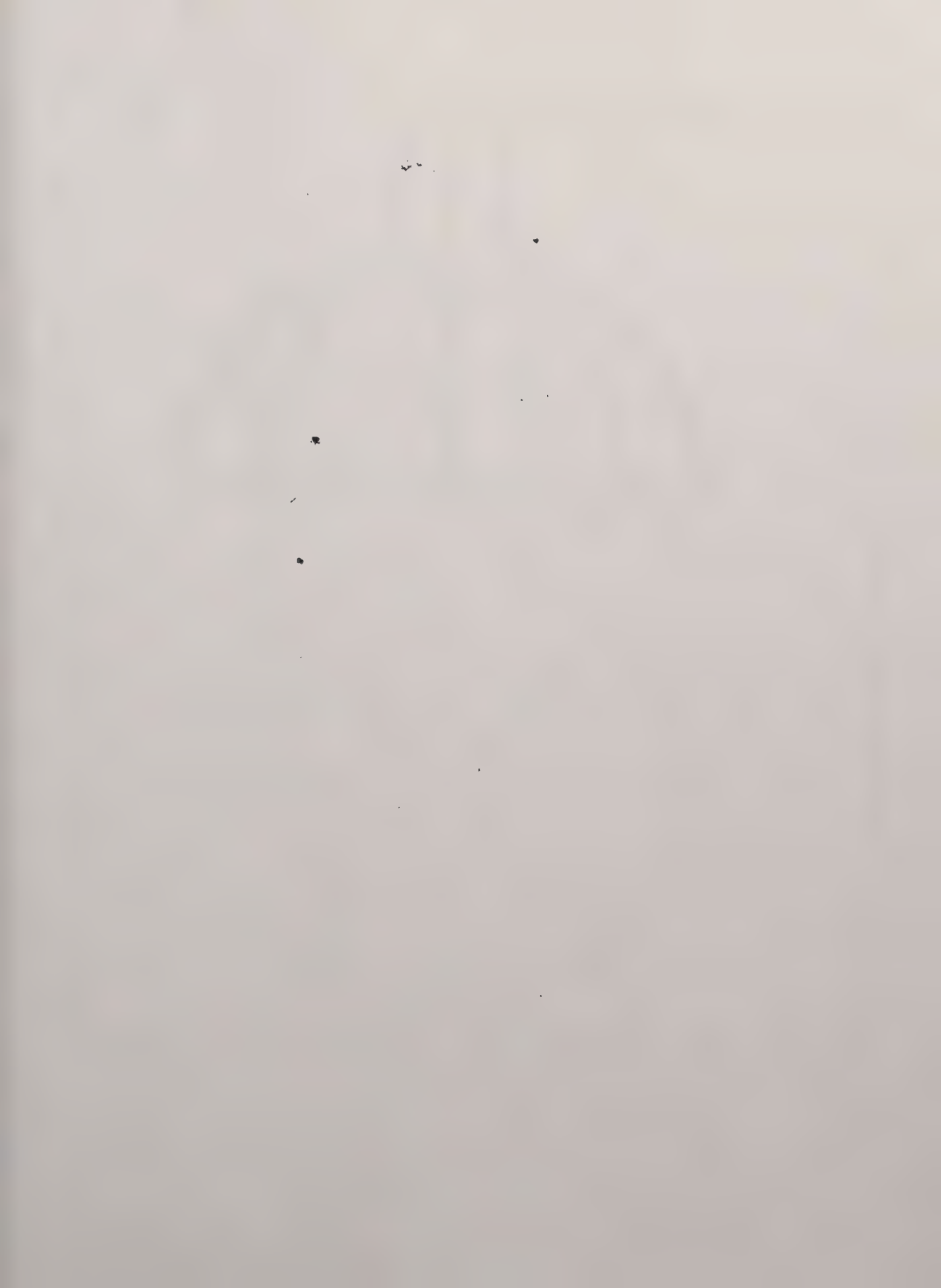


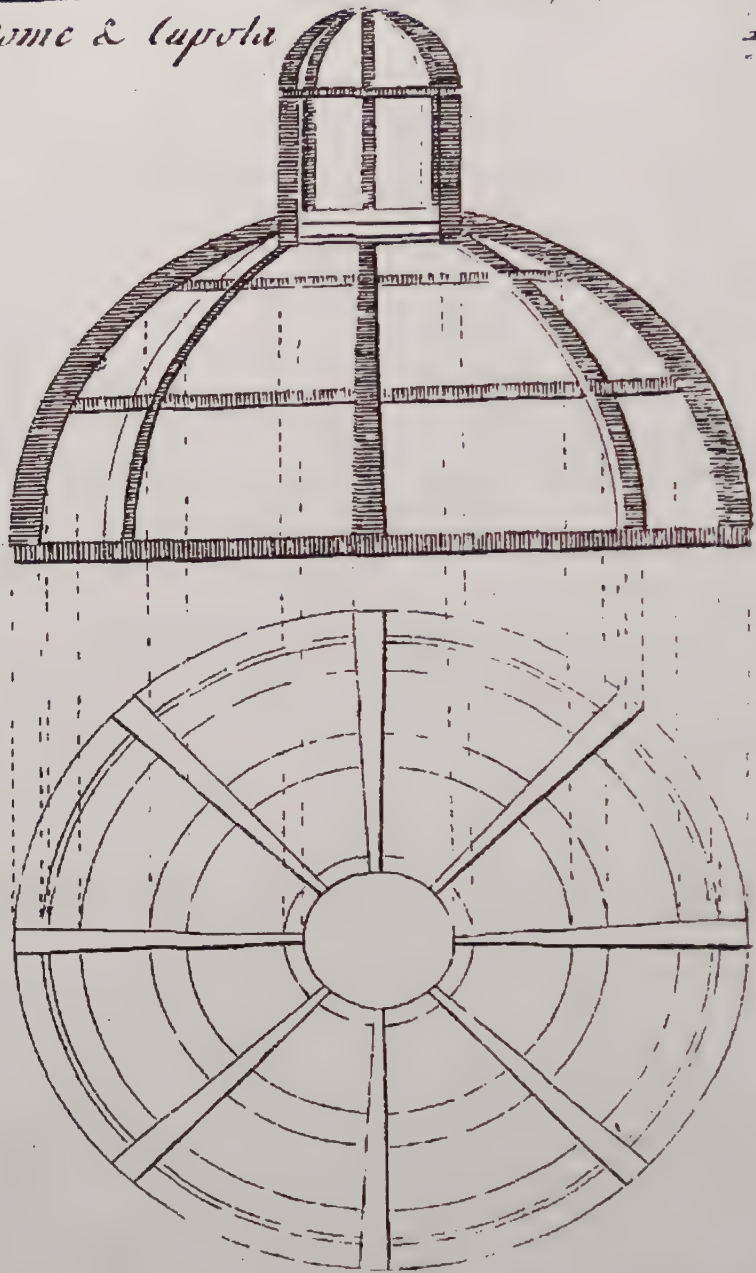


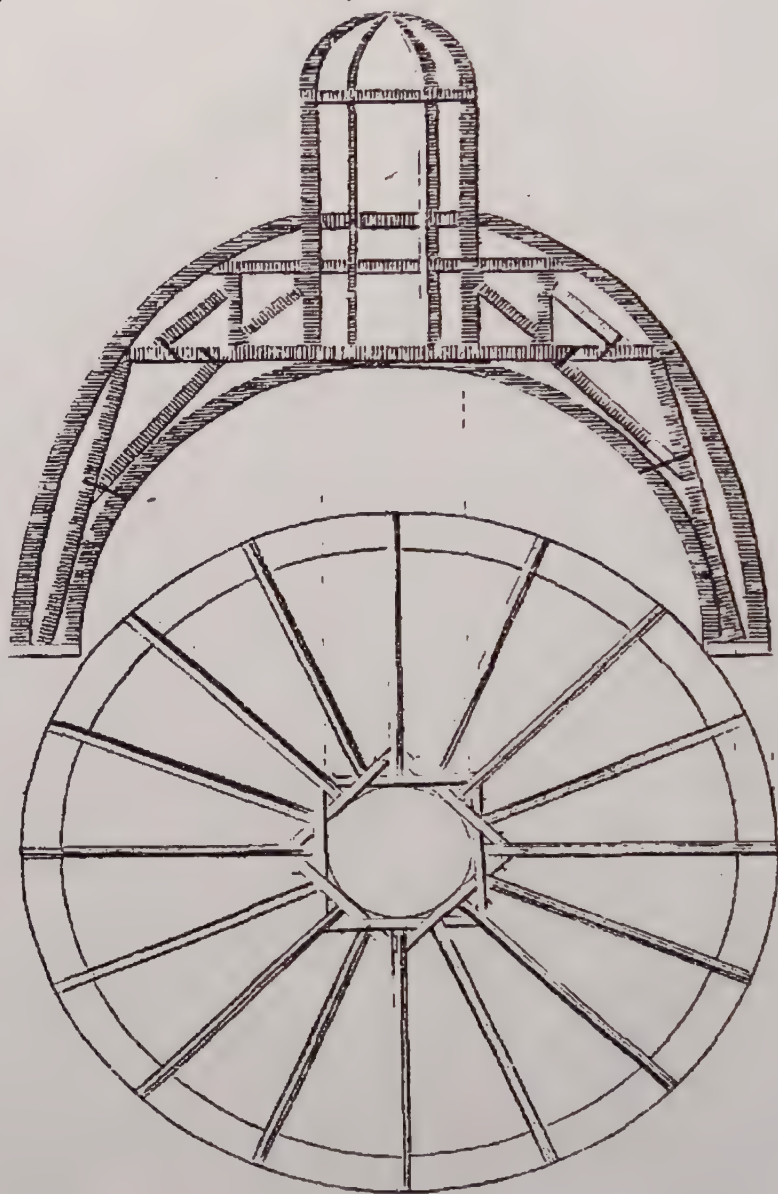
*Truss's för Ogeedehem
& Semicircular Dome.*

Pl. 96

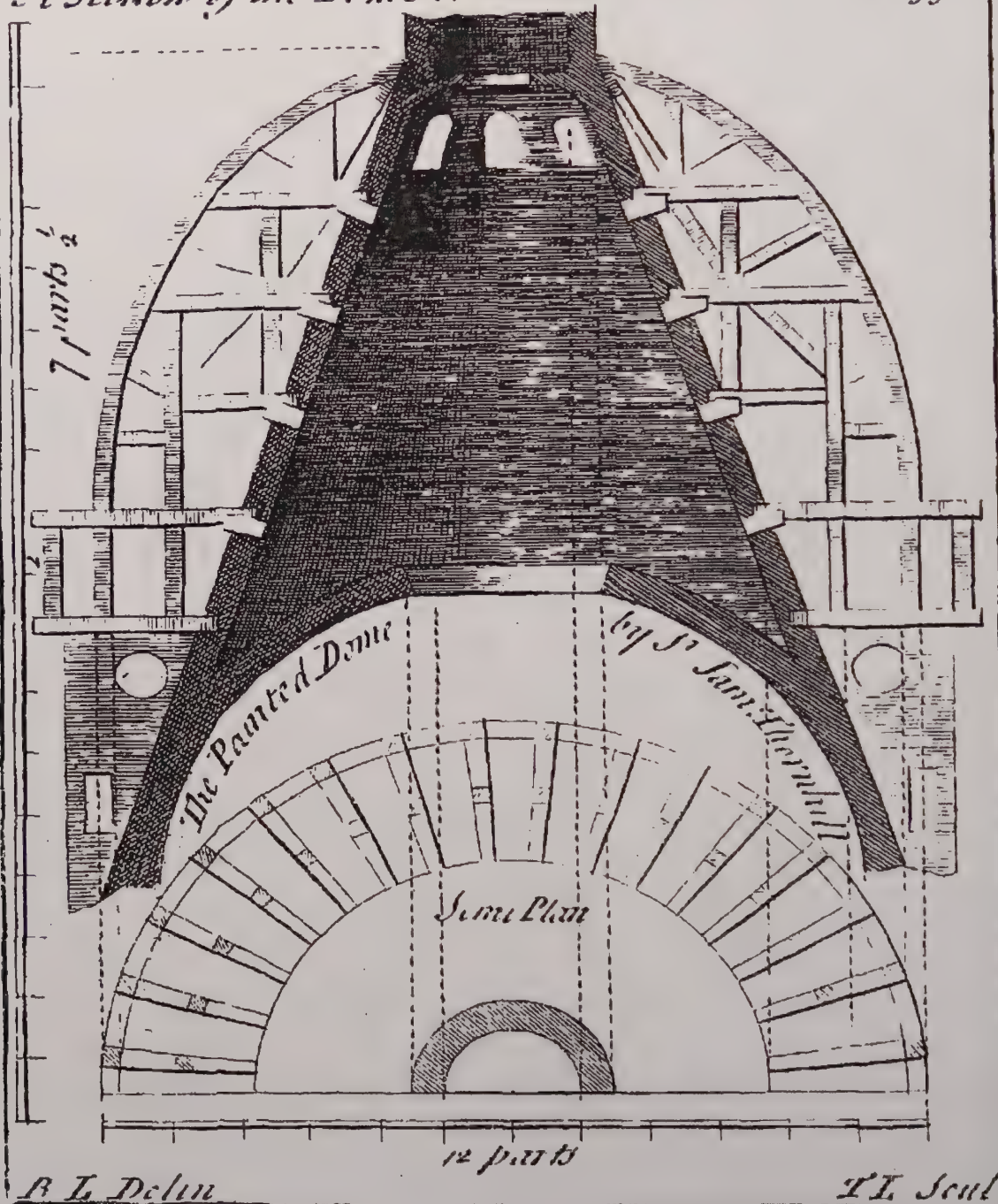








A Section of the Dome of St. Pauls London. Pl 99.





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